

12

THE
DIARY COMPANION;
BEING A
SUPPLEMENT
TO THE
LADIES' DIARY,
FOR THE YEAR 1799.

Containing Answers to the last Year's ENIGMAS,
REBUSES, CHARADES, QUERIES, and QUES-
TIONS; both in the DIARY and SUPPLEMENT.

With some New ENIGMAS, REBUSES, CHARADES,
QUERIES, and QUESTIONS, proposed to be
answered next Year.

Also, CALCULATIONS of the ECLIPSES; and
other New Discoveries in the Heavens.

By the DIARY AUTHOR.

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SUPPLEMENT
TO THE
LADIES' DIARY,
FOR THE YEAR 1799.

ANSWERS TO THE ENIGMAS.

<i>In the Diary.</i>		<i>In the Supplement.</i>	
1 Watering Pot	6 Bar	1 Fear	5 Hair Pencil
2 Blush	7 Name	2 Paint	6 H
3 Fame	8 Needle	3 Palm	7 or Pr. Happi-
4 Plague	9 Love	4 Bee	ness.
5 Box	10 or Pr. Bed- fellow.		

Other Answers to the Diary Prize Enigma, beside those inserted in the Diary, are as below :

9. *By Mr. T. Brown, of Surfleet, Lincoln.*

Says Sue to her sweetheart, "Leave off getting mellow,"
"Or else I protest I'll ne'er be your *Bedfellow*."

Suppose Eve and Adam together were talking,
They might be *Bedfellows*; but cou'd not when walking.

Eve was a *Bedfellow*, so likewise was Adam,

In spite of the wind or the weather;

But he was no *Bedmate*, nor was Mrs. Adam,

Unless they in bed were together.

10. *Advice: by the Rev. Mr. Ewbank, of Thornton-Steward.*

Ye ladies and gents, ere ye *Bedfellows* take—

Commission'd by Hymen—beware of mistake.

If your tempers shou'd suit not, 'twill greatly alloy

The comforts and pleasures, you else might enjoy.

11. *Emma's Wish: by Mr. John Fildes, of Liverpool.*

To find out the prize, when in vain Emma try'd,

I wish I'd the answer, she said, and then sigh'd.

And pity it is, one so lovely and young

As she is, should wish for a *Bedfellow* long.

12. *By Mr. R. Henson, of Bainton, near Stamford.*

How content with my pipe and my pot,

When November's chill blast howls around,

I sit by the fire in my cot,

And listen with joy to the found.

These are blessings I freely confers,

And the pipe, pot, and fire have their charms;

No. 12. Diary Prize Enig. answered. 3

But the greatest of all I possess,
Is a *Bedfellow* claspt in my arms.

13. To Mr. Wm. Wells; by Mr. Da. Roberts, of St. Columb:

If you have a *Bedfellow* that's faithful and kind,
One willing to please you, and just of your mind;
Your bliss is complete thro' the course of your life,
As you hinted last year, when you spoke of your wife.

14. Acrostic Answer, by Miss Eliza Still.

Help me, ye Muses, your aid I implore;
Unless you assist me, I cannot say more;
To tell Doctor Hutton how much I respect him,
That his favours I prize, and will never neglect him.
On the prize I've been musing, but language I doubt,
Nor nought but fond *Bedmates* will e'er make it out.

GENERAL ANSWERS TO THE DIARY ENIGMAS.

12. By Mr. Tho. Hindmarsh, of Rusheyford.

In softest themes doth Lady Di invite
Our trembling hands to strike the yielding lyre,
The latent knowledge, blended with delight
Throughout her pages, artfully conspire.

The youthful vot'ry on her riddles pore
Suspended.—Hopes, resolves, the task resumes,
Which, when unravell'd, gratify him more
Than sculptur'd *bottle*, fill'd with choice perfumes.

In mystic lines he next wraps *Bar* or key, 6
A *Plague*, *Fame*, *Blush*, each *Name* so just and clear, 4, 3, 2, 7
Informs his *Bedmate*, he expects to see 10
His lines recorded, the ensuing year.

< Such noble thoughts in early years impress'd,
All lawless passions from the breast remove;

Declining age in consequence is bless'd
With these attendants, comfort, hope and *Love*. 9

And as the *Needle* in the *Box* still tends, 8,
By secret virtue, to the northern pole,
To nature's path his mind as constant bends,
To trace, thro' parts, the author of the whole.

13. By Mr. Jonathan Horn, Land-surveyor, Briscoe.

Diaria's riddles now grow pat,
Some write on this, and some on that;
There's scarce a thing that you can *Name*
But it is fraught in *Dia's Fame*.

There <i>Love</i> and <i>Needle</i> now I see ;	9, 8
<i>Blush</i> , <i>Box</i> , and <i>Bar</i> , all must agree ;	2, 5, 6
Nay <i>Pan</i> and <i>Plague</i> adorn'd with wit,	1, 4
And <i>Bedfellow</i> the last will hit.	10

14. *Morning : by Mr. Rd. Humber, of Brighton.*

Retire ye shades—ye screeching owls retire—	
To paint a morn, Apollo aid the lyre—	
The op'ning sky unfolds with azure ray ;	
The clear illumine proclaims th' approaching day.	
Verging th' horizon, lo ! bright Sol appears,	
While warbling notes burst on the ravish'd ears—	
Each <i>Bedmate</i> now forsakes his downy nest,	10
'Midst odorous sweets, behold them blest ;	
A <i>Blushing</i> maid, with her <i>Waterpot</i> , prepares	2, 1
To drench the flow'rs with floods of falling tears.	
The sturdy oxen browse, with bellowing cry,	
And lambkins bleat as darksome shadows fly ;	
The mountain's brow, the spires are ting'd with gold,	
Reflecting gleams, so glorious to behold.	
Hodge leaves the hamlet for yon <i>Barley-mow</i> ,	6
A pretty milkmaid greets the morning now,	
And sweetly sings with well-poiz'd milking pail,	
While Colin <i>Plagues</i> with <i>Needles</i> <i>Love-sick</i> tale.	4, 8, 9
Lo ! bonny, blithsome, and replete with glee,	
The plowboy whistles o'er the furrow'd lea.	
Anon, in copious ray, the sunbeams play	
Upon the curling wave (kind <i>Fame</i> assist the lay).	3
The fragrant flow'rs exhale their <i>Nameless</i> sweets ;	7
Th' extended nostril soft sensation greets ;	
While pearly dew in drops like diamonds rise,	
By myriads glisten 'fore th' astonish'd eyes.	
Young zephyrs softly fan the tender trees,	
While stately <i>Box</i> but mocks the gentle breeze.	5
Ah ! short the bliss, how transient is the stay !	
Fresh morning yields—absorb'd in blaze of day.	

15. *Promiscuous Thoughts : by Mr. Tho. Rimmer, Schoolmaster, Standish, near Wigan.*

Each day confirms, we mortal are and frail ;	
When death approaches, what do <i>salts</i> avail ?	1
If <i>Blushes</i> indicate a guilty mind,	2
The <i>Needle</i> points to us and all mankind.	3
A lofty <i>Name</i> or sound attracts the ear ;	7
Why give it <i>Fame</i> , if reason is not there ?	3
The miser's <i>Box</i> from thieves is <i>Barred</i> fast ;	5, 6
His gold's his God—his <i>Plague</i> 'twill prove at last.	4
To dwell with saints and cherubims above,	
Is here to live in harmony and <i>Love</i> .	9

No. 12. Diary Enigmas answered.

5

On *Beds* of down some hundred thousands lie;
They give us rest—O may they when we die.

10

16. By Mr. Wm. Wells, of Crowle.

The <i>Name</i> and <i>Fame</i> of Lady Di	3, 7
Her friends <i>Blush</i> not to own,	2
For well they know the reason why	
Her <i>Love</i> to them is shewn.	9
Though now she be full ninety-five,	
She can her <i>Needle</i> thread;	8
Can <i>Bar</i> the door—her <i>Box</i> lay by,	6, 5
And still can earn her bread.	
She's not a <i>Plague</i> , as some might be,	4
The <i>Wat'ring-pan</i> she takes,	1
And when her friends and she agree,	
A good <i>Bedfellow</i> makes.	10

17. Spring: by Mr. Joseph Wilson, Black Callerton.

Hoary winter's <i>Barbed</i> train	6
With regret do quit the plain,	
And bid our isle adieu;	
While the <i>Blushing</i> god of day	2
Chases every <i>Plague</i> away,	4
Our pleasures to renew.	
The cuckow hopping in the vale,	
Sings with glee his <i>Famous</i> tale,	3
In chorus with the dove;	
The sweet exhilarating mead,	
Where the little lambkins feed,	
Exhibits only <i>Love</i> .	9
Wanton zephyr o'er the lawn,	
Lo his <i>Needled</i> curtain's drawn,	8
Renews his anxious care;	
Inviting to the <i>Boxen</i> shade,	5
Damon and his buxom maid,	
To breathe in softer air.	
Florio with a <i>Wat'ring-pan</i> ,	1
(Finds no <i>Equal</i> to his plan)	} 10
O'er the charming <i>Beds</i> ,	
With cautious steps exhaling pours	
The cheering liquid on his flow'rs,	
To raise their drooping heads.	

18. Ode to Hope: by Mr. Gilbert Young, Spalding.

Come, goddess Hope, oh heav'nly guest,
Extend thy influence o'er my breast,
To thee I yield my soul;

A 3

Do thou possess this nobler part,
Nor leave one corner of my heart,
Where gloomy thoughts may roll.

'Tis hope inspires the poet's song,
Hope leads the *Blushing* arts along,
Improving while complete ;
But were sweet hope for ever fled,
Despair on sorrow's heels wou'd tread,
With pond'rous leaden feet.

Pandora oft unbars, unlocks,
Of *Plagues*, her curs'd in-Famous Box,
And ills around us rise ;
Hope instantly disperses all,
She from the bottom shoots,—they fall—
And brighten'd are our skies.

Hope, like pure *Love*, of life's the zest,
Shews to the wearied *Nameless* rest,
And better things in view ;
Tells the sweet girl who lacks *Bedmate*,
There hangs within the wheel of fate,
One as the *Needle* true.

Hope can full bliss in prospect give ;
'Tis Hope alone that bids us live ;
Man to despair once hurl'd,
A self-assassin would become,
Nature grow pale with horrid gloom,
And here might end the world.

Of Hope's two daughters,—Joy's alert,
In Joy there's something rather pert ;
But Patience, modest, fair ;
This lovely nymph with downcast eye,
As if some beauty she'd descry,
Attracts us by her air.

Send these to me, companions sweet,
My wish in life is then complete,
In both I'd take such pride ;
To what I ask ye fates attend,
Give Patience for my constant friend,
And Joy to make my bride.

ANSWERS TO THE SUPPLEMENT PRIZE ENIGMA.

1. To Mr. T. Coulson ; by Mr. T. Brown, *Surfleet*.

Your prize I've guess'd, nor can I better show it,
Than in this couplet from my fav'rite poet ;

No. 12: Supp. Prize Enigma answered. 7

"Know then this truth, enough for man to know,
"Virtue alone is *Happiness* below."

2. To *Happiness*; by Mr. John Brooksbank.

Since reason first began t'illumine my mind,
In search of thee, I've trod life's mazy way;
But vain the search! for thee I ne'er could find:
Then where thy dwelling is, blest Goddess! say.
Is it amid the splendor of a court,
Where star-deck'd courtiers flatter, cringe, and bow?
Or 'mid the city's din dost thou resort,
Where vice and folly in one channel flow?
Methinks I hear thee softly answer, "No,
"I fly the circles of the gaudy great;
"But with the lowly peasant deign to go,
"And with my presence cheer his cottage neat."

If so, O! may it be the will of fate,
With health, and a snug cottage, me to bless;
And the sweet solace of a loving mate;
That I may prove thy sweets, O *Happiness*.

3. By Mr. B. Cleypole, London.

Let well-tim'd caution teach mankind to shun
The dang'rous paths by which some are undone;
And from all evil studiously refrain,
If real *Happiness* they would obtain.

4. By Mr. John Fowler, Ratbone Place, London.

Whatever diff'rent paths mankind pursue,
'Tis thee, O *Happiness*, we keep in view:
Thou charming something all our thoughts engage,
In early youth, or in declining age.

5. By Mr. Wm. Francis, jun. Sion School, Brentford.

Would'st thou obtain the heav'nly prize,
To virtue pay regard;
Shun ev'ry vice, and *Happiness*
Will be your sure reward.

6. By Mrs. M. Furnass, Heddon-on-the-Wall.

When night her sable wing extends
O'er snow and icy plains;
Then seated by a tap'ring light
I court Diaria's strains.
The mind on sounding pinions borne
Aloft through yielding air;
Here rests awhile in *Happiness*,
Too rapt'rous to declare.

7. *To Miss A. T. of London-Wall; by Mr. Jos. Gilbert.*

In vain conceal'd, your ever honour'd name,
 In spite of you, it must be known to fame;
 Such nice descriptions in your verses shine,
 While lively fancy animates each line;
 So sweetly flows the soft, harmonious strain,
 That while we read, we *Happiness* obtain.
 Another Sappho in thy muse revives,
 And anxious Phaon for thy favour strives.

8. *By Miss A. W. Maken, Liverpool.*

Ten thousand diff'rent ways mankind
 To *Happiness* pursue;
 But only those her mansion find,
 Who follow virtue's clue.

9. *By Parthenia, of Ousfwick.*

O *Happiness*, where art thou to be found?
 On earth thou dwell'st not, but in empty sound.
 True happiness is only found above,
 Where all is peace, and harmony, and love.

10. *Lines sent, with the Ladies' Diary and Supplement, to a Lady: by Mr. John Rimmer.*

I need not tell to one whose mind,
 Like yours, was ne'er to merit blind,
 What *Happiness* each year accrues
 To those who Dia's page peruse;
 Where sons of science, wit, and fame,
 So nobly gain a deathless name.

11. *Horace, Book I, Ode 11th, imitated.**To Mr. Wardley: by Mr. Rob. Sanderson.*

Enquire not, Wardley, ('tis not fit to know,)
 How long the time allow'd to us below;
 Life's checquer'd incidents, 'tis better still
 To bear with patience, be those what they will.
 Whether winters more are giv'n, or this must be
 The last, that swells the Charwell to a sea.
 Draw forth the gen'rous juice, let wisdom reign,
 And to life's shortness all your hopes restrain.
 Now while we chat and laugh and gaily sing,
 Invidious age has flown on rapid wing.
 Seize then the present, banish ev'ry sorrow, *Happiness.*
 Nor too much confidence place in to-morrow.

12. *By Mr. T. Smart, Burton-on-the-Wolds.*

O *Happiness*! our constant search below,
 All wish to know thee, yet how few e'er know!

No. 12. Supp. Prize Enigma answered. 9

When fortune smiles, with nature's bounties blest,
Then thou resid'st in something unpossess'd ;
Vain child of folly cease, nor hope to find
In toys, a blessing seated in the mind.

13. *Acrostical Answer, by Miss Eliza Still.*

Hail thou delightful theme for pious minds,
Angelic thoughts possess thy heavenly good,
Pleasing thy prospects—O may my wish'd designs
Pursue the path that leads to thy abode.
In vain I seek thee in the busy crowd.
Neglect and frailty steal upon my view,
Eager to catch thee still the task renew.
S ever'd from thee—O fortitude, step in ;
S ecur'd by thee, the glorious prize I win.

14. *By Miss A. T. of London-Wall.*

O *Happiness* ! how various are the ways
Vain man pursues, in search of lovely thee.
But when from virtue's paths he daring strays,
He never will thy num'rous blessings see.

15. *By Mr. Gilbert Young, of Spalding.*

Happiness long I fought in vain,
But now it's set before my eyes ;
And Coulson says I may obtain
The dear inestimable prize.

Various other separate and ingenious answers to the Prize Enigma were also given by the following ladies and gentlemen, viz. W. Anderson John Coultherd, Tho. Coultherd, Sarah Cowen, Thomas Crosley, James Dick, Edwin, Rev. J. Ewbank, John Fildes, Sam. Harvey, Fl. Hill, Jos. Hindson, J. Horn, Rd. Humber, Ja. Mulcaster, Petrucchio, Tho. Rimmer, Da. Roberts, R. Robinson, John Rutherford, John Savage, Rev. J. Shackleton, John Smith, T. Thorpe, Lucinda Wainfleet, Jos. Wilson, Eliz. Wright, &c.

GENERAL ANSWERS TO THE SUPPLEMENT ENIGMAS.

I. *Ode to Poverty : by Mr. Tho. Coulson, Rookhope.*

Oh poverty, of pale consumptive hue,
Forbear to haunt my footsteps still in view.
Of thee I'll sing ; tho' now, with flagging wings,
Droops my dull muse, and trembles as she sings.
By thee oppress'd, I scarce can touch the lyre,
Or catch one spark of true poetic fire.—
Chang'd is the scene, since late in yonder shade,
With peace and plenty hand in hand I stray'd.

Swift turns the wheel of changeful fortune round;
 And he that soar'd, now flounders on the ground.
 To me the cares of life were once unknown;
 I wish'd not fortune's smiles, nor *Fear'd* her frown.
 Launch'd in the sea of life, I now must brave
 The boist'rous shock of ev'ry adverse wave.
 At balls or plays of late I have not *Been*,
 Nor trust to pleasure's more alluring scene.
 Come then, contentment, calm my troubled mind,
 Comfort from thee O may I ever find.
 If poverty and pain my soul oppress,
 And every minute make my little less,
 To thee I'll seek to ease my load of woe;
 For sweet content is *Happiness* below.
 O may I still untouch'd that jewel guard,
 And trust to *Heaven* to meet a just reward;
 Where momentary ills no more molest,
 And cares no more disturb my tranquil breast;
 In trembling hopes to reach that blest abode,
 And dwell with saints, with angels, and with God;
 With *Palms* of victory there I'll sing his praise,
 Amidst the mild effulgence of his rays,
 To hear his voice——But whither roves my song?
 For themes like these to abler bards belong.
 Some gentler verse O let my *Pencil* chuse,
 That suits a humble, yet an honest muse.
 But cease my pen, my lips forbear this strain,
 And strike some softer string to sooth my pain.

2. *Ode to the New Year: by Mrs. M. Furnass.*

Again we view the rising day,
 Clad with zephyr's balmy wing,
 Expanding wide the genial ray,
 And waking nature's silent string.
 No longer winter's icy power
 Usurps the *Pencil'd* verdant mead;
 Nor livid clouds pour down the shower,
 And crush the *Pained* vi'let's head.
 But see! the *Herald* of the morn,
 Remounted, cheers each hill and dale;
 While wak'ning songsters of the thorn
 Salute the gentle passing gale.
 The Hyblean *Bees*, no more in *Dread*
 Of raging elemental war,
 Now on the blooming *Palms* do feed,
 Now sunk in thyme a distance far.

No. 12. Supp. Enigmas answered.

11

"From shore to shore, from pole to pole,"
Life's *Happiness* emerges forth,
Unfolds the bud, as changes roll,
And black'ning tempests quit the north.

7

3. *Rural Pleasures: by Mr. Jos. Hindson, Lincoln.*

Rural pleasures now invite me,
Pleas'd to tread the leafy grove;
There the *Humming Bees* delight me,
As from bud to bud they rove.

6, 4

Flora's sweets around are springing,
And their *colour'd charms display*;
Birds on ev'ry bush are singing,
Warbling forth their tuneful lay.

2, 5

There the little lambkins skipping,
Where the brooks in murmurs glide;
Or the cheering nectar sipping,
Near the watchful mother's side.

There the rustic *Happy swain*,
With his fav'rite blooming lass;
Strangers they to *Fear* and pain,
Crown'd with peace, their days do pass.

7

1

3

Grandeur, courts, and cities, blush,
And your gaudy trappings hide;
Riot and intemperance, hush!
Your pretended joys subside.

Vain are all your gilded treasures,
Vain is each fallacious sweet;
A rural life has greatest pleasure,
When content and virtue meet.

4. *By Mr. Tho. Rimmer, to Miss Jenny Meddows, of Formby, near Liverpool.*

'Tis well, sweet maid, in virtue you delight;
That and your beauty make a dazzling sight:
As *Bees* cull *Honey* from each fragrant flow'r,
So you will peace from ev'ry well-spent hour.
Tho' you with *Paint* and *Pencils* richly drawn
On canvas neat, each feature nicely shewn;
Your native virtue is more sweet and true:
What charms and virtues jointly bloom in you!
Fear not to raise them to perfection here;
Above they'll shine, in *Bliss* as *Laurels* there.

4, 6

2, 5

1

7, 3

5. *To Dame Fortune: by Mr. Rob. Sanderson.*

Madam, your most obedient slave.

'Tis strange! a prize last year you gave,

In spite of former shyness,

To one, plung'd deep in mire and foil,

Who ne'er *Before* receiv'd a smile

From your blindfolded *Highness*.

Your ladyship must sure be wrong,

Thus to reward a trifling song:

Great Gods! what madness is it!

Indeed it is quite inconsistent,

(For long I've thought you non-existent)

To pay to me a visit.

The *joy-fraught Laurel* you bestow

On one, whom erst you did not know;

I cou'd as soon have thought

The pale-fac'd Goddess of the night

Down from her sphere shou'd take a flight,

And peep into my cot.

And now I think 'tis quite unkind,

Our wise folks all shou'd *Paint* you blind;

But if again to me,

Next year, you grant another favour,

Fear not; my *Pen* shall well endeavour

To prove that you can see.

6. *The Rev. J. Shackleton, on the Tyro-Society meeting weekly at Mr. Haigh's Academy, Bradford, Yorksbire.*

"To search for Truth in Academic Groves,"

Is wisdom's choice:—and eagerly she roves,

From art to art, and culls the fragrant sweets,

Of each delightful flow'r, with which she meets.

But then, alas! the span of-vig'rous days

Is much too short for one to merit praise

In every science.—'Tis therefore the plan

Of this society, that every man

His "*Velle suum*" weekly do produce,

To brethren met, its merits to discuss.

Thus, whilst on mathematics one is bent,

Another, with no less laudable intent,

The *Pencil's* shade, or *Beehive* drawn in *Paint*,

Will well examine, or perhaps descant

On air or light:—another will declaim

On *Fear* or *Happiness*, to gain the *Palm*.

The remainder of this composition is omitted, containing the answers to the Rebuses and Charades; as the Diary Correspondents have repeatedly been requested not to give the answers to these in the same piece with that of the Enigmas.

7. *Invocation to Peace*: by Mr. T. R. Smart.

In leafy glade, or mossy dell,
 Beneath the lowly shed;
 Or where, meek virgin, dost thou dwell,
 Where rests thy fainted head?
 Far from our isle, by war distressed,
 Driv'n by contending foes;
 To climes where, with thy presence blest,
 Thy sacred olive grows?—
 Thy cheek with roses *Pencil'd* o'er,
 Is pallid now with *Fear*;
 Trembling to hear the cannon roar,
 And *Paints* thy danger there.—
 O chant once more thy *Heav'nly* strains,
 Destroy this horrid pest;
 Bring plenty to our fruitful plains,
 And to our cities rest.—
 O rear thy *Palm*, exalt thy voice,
 Let Gauls and Britons join;
 In long prosperity rejoice,
 And worship at thy shrine.—
 Then years shall roll to ages down,
 Sweet friendship e'er increase;
 True *Happiness* thy efforts crown,
 And nations value peace.

8. *A Pastoral*: by Mr. John Smith, Alton Park.

The sun had long declined in the west,
 The shepherd swains had all retir'd to rest,
 Save Damon sad, who sought the silent grove,
 O'erwhelm'd with grief, distracted sore with love.
 Beneath a spreading *Beech*, whose boughs o'erhung
 A murmur'ing river, thus he doleful sung:
 Ah! Delia, Delia! faithless and unkind,
 What poignant grief disturbs my tortur'd mind!
 Ah! why in wiles deceitful were you skill'd?
 Your charms would make the most obdurate yield.
 Perfidious nymph! O say, what have I done,
 That, 'stead of smiles, you meet me with a frown?

Say, whence this coyness, why this cold disdain,
 That wounds my feelings, and distracts my brain?
 I *Fear* another with your love is blest,
 Some object new has fir'd your fickle breast.
 Ah, cruel Delia! can you then forget
 Our ecstasies when in the *bow'r* we met;
 Ah! can you fail our blifs to call to mind,
 When folded in my arms you lay reclin'd;
 When oft you vow'd—ah! what deceit in love!
 "True as the needle to the pole" you'd prove?
 What pleasing raptures then each day brought on!
 Each day methought your beauties brighter shone.
 With what delight I on your charms did gaze!
 But, mem'ry, cease to *Paint* those happy days;
 For now I'm made the object of her scorn,
 A swain dejected, wretched, and forlorn.
 To stem the raging torrent of my grief
 In vain I strive—in vain I seek relief.
 For me on earth no *Happiness* remains;
 Come, friendly death, and ease me of my pains.
 Adieu, false nymph! adieu, ungrateful fair!
 Here will I put a period to my care,—
 Here will I end my woes—O grief extreme!"
 Thus Damon said—and plung'd amid the stream.

9. *Thoughts on Winter: by Mr. Jonathan Horn.*

Now winter's killing blasts do blow,
 And sweep the russet plains;
 Where blooming *Palm-trees* erst did grow,
 Rude desolation reigns.
 The *Painted* leaves that play'd on *High*,
 And wanton'd in the air,
 Brush'd off by winds, neglected lie,
 Devoid of *Fear* and care.
 But see blithe spring return again,
 And all creation smile;
 While kindly show'rs refresh the plains,
 On this our *Happy* isle.

10. *By Miss Eliz. Wright, of Flaxton.*

Hail! lovely Di, thou welcome *Palm*,
 How pleasing do I see
 The verse now *Pictur'd* in thy page,
 That erst I sent to thee.

Other
 were a
 croft,
 Jof. G
 Da. K
 Thomp
 fton, v
 ing to

Rel
 1 Lin
 2 Sm
 3 M
 4 Pri

No comb my ringlets shall essay,
 No *Fear* my mind depress,
 Till I, thou sweet laborious *Bee*,
 Do wish thee *Happiness*.

1
4
7

Other general and ingenious answers to the Supplement Enigmas, were also given by the following ladies and gentlemen, viz. J. Asb-croft, Henry Boiley, Tho. Coulterd, Sarah Cowen, J. Ewbank, Jos. Gilbert, Sam. Harvey, J. Horn, W. Hostman, Rd. Humber, Da. Roberts, John Rutherford, John Savage, Miss A. T., J. J. Thompson, Ja. Thoubren, Jos. Wilson, &c. Also by Mr. W. Wool-son, whose ingenious answer was unfortunately much too late in com-ing to hand; as also Mr. Hostman's, and several others.

REBUSES AND CHARADES ANSWERED.

<i>In the Diary.</i>		<i>In the Supplement.</i>	
<i>Rebuses.</i>	<i>Charades.</i>	<i>Rebuses.</i>	<i>Charades.</i>
1 Lincoln	1 Boatswain	1 Stone	1 Lighthouse
2 Smart	2 Damage	2 Milton	2 Courtship
3 Malice	3 Campbell	3 Chat	3 Warsaw
4 Prize	4 Ribband	4 Clifton	4 Chairman.

DIARY REBUSES AND CHARADES ANSWERED.

12. By Mr. Tho. Coulterd, of Frosterly.

I hail thee, fair science, with humble respect,
 And gladly would list in thy train;
 Pray treat not a pupil with utter neglect,
 Nor thrust him away with disdain.

Thou, the *Prize* to or *Campbell* or *Smart*,
 And *Ribbands* may justly bestow;
 They merit the favors that thou dost impart,
 As fair *Dia's* pages can show.

I ask but thy smile, I ask thee no more,
 Fell envy I then will defy;
 Tho' *Malice* like great *Tom* of *Lincoln* shou'd roar,
 Or a *Boatswain* when *Damage* is night.

13. By Mr. Joseph Gilbert.

From the low marsh, where Lincolnshire extends,
 The muse again her yearly tribute sends;
 Whose sacred strains the glowing mind refine,
 While all around the floods reflecting shine.—

As when the sailor lifts his anxious eyes,
 To view the horrors of tempestuous skies,
 While loud the wind a growing storm foretells,
 And big with *Damage* ev'ry billow swells;
 "Attend your posts," the Boatswain's cry resounds,
 "Your posts attend," for danger wild surrounds.
 Arous'd, upon the deck they instant stand,
 Appall'd obey the ominous command.
 Terror appears in ev'ry visage shown,
 While black'ning clouds o'er all the ocean frown,
 Each ling'ring hour with death tremendous threats,
 With dread emotion ev'ry bosom beats.
 At length, soft darting thro' the gloom of night,
 A ray refulgent glows with op'ning light;
 A mutual gleam dispers'd o'er ev'ry mind,
 Each boding fear, for peace and joy resign'd.—
 So Dia's pages met my longing eyes,
 So pleasure beam'd attendant with the *Prize*.—
 Could I, like *Campbell*, just applause obtain,
 Like tuneful *Smart* command a noble strain;
 Like his, did each idea bright appear,
 Tho' smooth yet full, tho' comprehensive, clear:
 Ah! could my fair like his Eliza live,
 Could I, like him, immortal praises give,
 Dia's lov'd page should far extend her name,
 Nor envious hate nor *Malice* stop her fame;
 Justly the muse would all her charms express,
 In all the ease and elegance of dress;
 As fancy paints her to my longing sight,
 Grace in her form, and in her smiles delight;
 Loosely her robe in easy grandeur shows,
 While from her waist a *Ribband* careless flows.

14. To Mr. Smart; by Mr. Robert Sanderson.

Horace, Book 1st, Epistle 4, imitated.

Oh! *Smart*, thou candid critic of my rhyme,
 Say how at Burton do you spend your time;
 Busy'd in writing, what will soon excell
 The works of *Campbell*, tho' he writes so well;
 Or saunt'ring silently 'midst rows of trees,
 Where health triumphant rides on ev'ry breeze;
 A foe to *Malice*, judging best to *Prize*
 Things only worthy of the good and wise.
 Your mind's above the "wooden million" plac'd,
 Your form's with ev'ry manly beauty grac'd;

No. 12. Rebuses and Charades answered. 17

Wealth you possess enough for mod'rate use,
 Skill to enjoy it, free from wild *abuse*. *Damage.*
 What cou'd the fondest mother wish for more,
 Than that her much-lov'd offspring, full of lore,
 Shou'd powers possess to draw his learning forth,
 And self-assisted, shew the man of worth?
 Fame, praise, and health abundantly shou'd find, *Ribb-*
 A decent living, and a purse well *Lin'd*. *coln.*
Buoy'd up by hopes, or *sunk* by meagre cares, *Boatfw.*
 Amid disquietudes and anxious fears,
 Each day that shines do you the last believe,
 Shou'd one unhop'd for come, new joy 'twill give.
 —Soon you shall see, (wou'd you enjoy some mirth)
 Me fat and blooming, healthful, and so forth;
 Blessings, that flow from causes such as these,
 Good gen'rous living, and a heart at ease.

15. By Miss Serena Scott, Queen's Square.

In the city of *Lincoln*, of ancient repute,
 A *Smart* lady dwells, whose bright eyes,
 Were the apple of Paris again in dispute,
 Spite of *Malice*, would bear off the *Prize*.

When the *Boatfwain* from *Damage*, to save her from wreck,
 On board his brave ship pipes all hands on the deck;
 So *Campbell* *, the pride of the Scots, gave alarm,
 In the ship of the state, to retrieve her from harm.
 His sov'reign well pleas'd with his deeds and his name,
 Gave the *Ribband* and star, the bright emblem of fame.

Another Answer by the Same: to Capt. Campbell.

Boatfwain, see the storm is rising,
 Pipe all hands upon the deck;
Damage come, there's no advising,
Campbell save the ship from wreck.

Pilot, by fame's pole-star steer us,
 Thro' the dreadful sea of war:
 Danger of destruction's near us,
 From the port of peace too far.

Save, O! save the ship, yet straining
 Ev'ry mast and cord and sail,
 That the port of peace regaining,
 Our brave heroes we may hail.

* *Great Duke of Argyle.*

Then Albion's fair ones, at your landing,
 Shall bring you tokens of renown ;
 Each victor's head with laurels banding,
 Like flaunting *Ribband* on their own.

16. By Mr. T. R. Smart.

Prize, *Lincoln*, *Malice*, *Boatswain*, *Ribband*, part,
 With *Damage*, *Campbell*, and your T. R. Smart.

17. *The Choice of a Wife* : by Mr. John Smith.

Should all-gracious providence, bounteous and kind,
 E'er deign to bless me with a wife,
 To soothe, with her gentle endearment, my mind,
 And soften the cares of this life :

Like the city of *Lincoln*, I'd have her renown'd
 For all that is virtuous and good ;
 In good-humour and *Smartness* I'd have her abound,
 And, like *Campbell*, with wit be endow'd.

Not with tawdry *Ribbanas*, that make a fine show,
 But with neatness should she be e'er drest ;
 Nor wilfully *Damage* to any one do,
 Nor should *Malice* e'er dwell in her breast.

Such an amiable partner as this I would *Prize*,
 More than *Boatswain* delights in calm weather ;
 No cares of this life should annoy our fond joys,
 But content we'd live happy together.

SUPP. REBUSES AND CHARADES ANSWERED.

1. By Mr. T. Coulson, of Rookhaze.

When snug in my cottage, by *Lighthouse* surrounded,
 And silence stood watch at my door,
 Ungarnish'd by titles, with *Dia* confounded,
 Each rebus would gladly explore.

I call'd for a pen, soon to write at my leisure,
 All cares for a while threw aside ;
 With Miss *Stone* and *Milton* I'd converse with pleasure,
 Or *Chat* with my beautiful bride.

How pleasing 'tis then to look back on the morning
 Of life, and the *Courtships* of youth,
 When fancy's gay beam the bright prospect's adorning,
 And beauty is cherish'd by truth.

No. 12. Rebuses and Charades answered. 19

At *Warsaw* a maid once gave my heart anguish,
Miss *Clifton* assuaged the pain;
But, false to her vows, she soon left me to languish,
Till *Chairman* dissolved the chain.

But soon all their spells my true love did banish,
When I her perfections did view;
As a mist on the mountain my fears did all vanish,
Or quick as the sun slips the dew.—

That her empire long, and with splendour may flourish,
Is what I most ardently crave;
And when the soft flame I no longer can nourish,
Then let me drop into my grave.

2. By Mr. Tho. Coultherd, of Frosterly.

When the hours of study are gone,
Oft with a dear friend I retire;
To *Chat* of a *Milton* and *Stone*,
Or the horrors of *Warsaw* admire.

A *Lighthouse* or *Clifton* may do,
As a change to enliven the talk;
Or *Courtship* and marriages too;
Till a *Chairman* endeth his walk.

3. By Mr. John Fildes, of Liverpool.

The *Courtship* that pass'd between Adam and Eve,
Was very refin'd, if you *Milton* believe;
Who, tho' he has long been as dead as a *Stone*,
His works will remain, and as long will be known,
As *Chairmen* shall ladies who *Chat* much attend,
Or as the tall *Lighthouse* shall seamen befriend.
In *Warsaw* perhaps such a bard was ne'er bred,
And *Clifton* no doubt his choice writings has read.

4. By Mr. Sam. Harvey, of Lyme.

Stone and *Milton*, if I'm right,
Two rebuses explain,
And *Chat* and *Clifton* bring to light
The others that remain.

A *Lighthouse*, *Courtship*, and *Warsaw*,
Will three charades unfold;
A *Chairman* is the last I trow;
Now, ladies, all are told.

5. By Miss A. W. Maken.

Tho' *Stone* and *Milton*, *Cbat* and *Clifton*,
 To the muse are ever dear,
 With *Lighthouse*, *Courtsip*, I get swift on,
Warsaw, *Chairman* fill the rear.

6. By Mr. John Rimmer, of Liverpool.

Why *Clifton* now so silent keeps,
 E'en *Milton* would not guess;
 That he ne'er opes to Di his lips,
 Is strange we must confess.
 Of *Lighthouse*, *Chairman*, *Warsaw*, *Stone*,
 In pleasant *Cbat* he'd talk,
 And often *Court* the nine, 'twas known,
 Where *Shenstone* us'd to walk.
 But now no more the passing gale
 His tuneful notes convey,
 In pleasing echos thro' the vale,
 And near yond' hills decay.

7. By Mr. Tho. Rimmer, Schoolmaster.

As wand'ring o'er the flow'ry meads,
 Puzzling my brains with Di's charades,
 A tender pair, in *Cbatting* strain,
 Came slowly o'er the verdant plain.
 Thought I, in *Courtsip* they're engag'd,
 Conning once more that sacred page,
 I'll cross the mead—Upon a *Stone*
 I sat me down, and read *Milton*;
 But ev'ry now and then a scan
 I gave the lovely maid and man.—
 With brisker steps they seem'd to walk;
 Approach'd so near, I heard them talk.
 Of what?—Not love—but *Warsaw's* fate,
 By war distress'd so much of late,
 Of *Chairmen* in fam'd London streets,
 Of Mr. *Clifton's* learned sheets,
 Of *Lighthouse*, how it saves from harm
 Desponding sailors in a storm.—
 Can this be *Courtsip*?—No, thought I;
 It springs from friendship's sacred tie.
 A silence for a while took place;
 He bus'd her, and he prais'd her face.

No. 12. Rebuses and Charades answered. 21

It dusky grew—they march'd away,
And so did I—why should I stay?—
Next morn the bells most tuneful play'd,
Because to Hymen's they had stray'd :
I smil'd—I blest'd the powers above ;
And said 'twas friendship and 'twas love.

8. By Mr. John Savage, of Norton.

Stone and Milton, Chat and Clifton,
Every Rebus sure will name ;
Lightbouse, Courtship, Warsaw, Chairman,
Each charade will do the same.

9. By Mr. T. R. Smart.

Clifton, Chat, with Stone and Milton,
All the Rebuses explain ;
Lightbouse, Courtship, Warsaw, Chairman,
Do as much for what remain.

10. By Mr. John Smith, Alton Park.

Cbloë's fair, and her mental acquirements are rare ;
As a Lightbouse illum'd she conspicuous shines ;
Her form is engaging, her dress debonair,
For in it both neatness and taste she combines.
Love from her eye darteth, and from her sweet mouth,
When she's Chatting, the purest of sentiments flow ;
Like Milton and Clifton, she's fam'd north * and south,
And, so well she's belov'd, she has not one foe.
The spruce Mr. Stone, a youth well-inclin'd,
Close Courtship has made to this amiable fair,
And if they in Hymen's soft bands shall be join'd,
May the blessings of plenty and peace be their share.

11. By Mr. G. Young, of Spalding.

The answer I give is very short ;
Proximity sha'n't be its fault.
Milton's head-stone and Clifton's Chat,
The rebuses answer to a pat.
Lightbouse, Courtship, Warsaw, Chairman,
Solve the charades to a hair, man.

* Warsaw.

Various other ingenious answers to the Supplement Refuses and Charades, were given by the following ladies and gentlemen, viz. F. Ashcroft, H. Boilev, John Cavill, Sarah Cowen, F. Ewbank, J. Hatfield, Jos Hindson, Jona. Horn, Wilos Hostman, Rd. Hum-ber, Da. Roberts, John Rutherford, Wm. Saint, J. Shackleton, J. J. Thompson, James Thoubren, Eliz. Wright, &c.

QUERIES ANSWERED.

1. DIARY QUERY answered, by Mr. Jonathan Horn,

This query depends much on circumstances. But where true love is fixed on virtuous principles, absence cannot diminish it.

“For passion by long absence does improve,
And makes that rapture which before was love.”

2. DIARY QUERY answered, by Mr. R. Robinson, of Bowes.

Shrove-tide was used by the primitive christians as a preparation to the solemn fast of Lent. Hence pancakes on Shrove Tuesday were prepared, as a lighter kind of food, to render their bodies more tractable and fit for that sacred solemnity.

3. DIARY QUERY answered, by Miss Eliz. Wright.

Enjoyment surely must claim the preference; for hope is a delusive phantom, but “The desire accomplished is sweet to the soul.”

4. DIARY QUERY answered, by Mr. J. Hatfield.

Dr. Hutton, in his Math. and Philos. Dict. vol. I. pa. 376, has given a table of the greatest, mean, and least apparent diameters of the sun, moon, and planets, in different situations, as determined by several astronomers: whence it appears that the sun's apparent diameter generally exceeds that of the moon.

The same, by Virlet.—According to De la Hire, the greatest apparent diameter of the sun is $32' 44''$ and the least $31' 38''$; also those of the moon $33' 30''$ and $29' 30''$. So that when the sun is in his perigee, and the moon in her apogee, the apparent diameter of the former exceeds that of the latter, and the contrary. And this different apparent magnitude of the luminaries was evinced on the 15th of May 1798, by the central and annular eclipse of the sun, when he appeared greater than the moon by the narrow splendid ring of light encompassing the moon's dark body on every side. And the contrary appearance

happened on the 8th of November following, in the solar eclipse, as the moon's apparent disk at that time somewhat exceeded the sun's.

I. SUPPL. QUERY *answered, by Mr. Tho. Crosby, York.*

It is agreed by modern philosophers, that the atmosphere in which we breathe, is a heterogeneous mass of airs, ethereal, magnetical, electrical, &c. Hence it is probable that every plant, shrub, and flower, imbibes different kinds and quantities of these airs, according to their textures, &c, thus giving them their different tastes, smells, colours, &c. And perhaps it may be the nature of the sensitive plant to imbibe large quantities of the electric fluid; so that when any point, as one's finger end, touches it, that fluid immediately rushes out, causing the plant to shrink and close itself up, by the temporary loss of that which is the cause of its vigour.

2. SUPPL. QUERY *answered, by Mr. Tho. Coulson.*

I have an old book by me which says, that Free-masonry was first introduced into England by one Bennet a monk, about the year 670.

Mr. Tho. Coulterd says, As Free Masons claim Hiram for their founder, the builder of Solomon's temple, I imagine it to be an eastern institution; and as there was but little or no intercourse between those countries and England before the time of the Crusades, its introduction would probably be about that time,

Mr. Tho. Crosby says, In the time of Henry the 6th Free-masonry was introduced into England by the Pope. This head of the church sent a number of workmen over who were skilled in Gothic architecture, and, having his bulls, were accounted free; hence arose the epithet "Free and Accepted Masons." This set of men invented lodges, for the purpose of relieving the necessitous, or those out of work, or such as were on the tramp; and, that they might not be deceived or imposed on in these particulars, they invented certain secret signs, which are still in use.

Mr. Jonathan Horn says, Free-masonry was first introduced into England by the Phenicians, who came over with the Tyrian Hercules; but at what time, is not certain.

SUPPL. QUERY *answered, by Mr. Tho. Coulterd.*

The air which flows from the sea is always more dense than that which comes from the land, and consequently makes the quicksilver rise. And the ascent of the clouds would be pro-

portionable to the rise of the mercury, were the density of the air at that height the same as at the surface of the earth.

The same, by the Rev. Mr. Furnass.—It appears, from remarks made in Dr. Hutton's Dictionary, article Barometer, that the wind blowing off the sea, by driving the condensed air and nitrous particles (natural consequences of that element) elsewhere, must load the atmosphere and increase its pressure. Hence then, the effect of the wind counteracting the other physical cause, the mercury in the barometer tube will rise, though we have not at that time rain or snow.

4. SUPP. QUERY answered, by Mr. Tho. Coultherd.

The small hole in the covers of tea-pots seems to be of use in two respects. First, it suffers the air, which is contained between the water and cover, as it rarefies by the heat, to escape, which would otherwise force part of the tea out of the spout, or else lift up the lid. Secondly, it assists the pot in pouring, by giving free admittance to the air, as the tea emptieth out.

The same, by Mr. Jos. Hindson.—These holes, in my opinion, serve to let out the steam, and to admit the air. For, when boiling water is poured into the tea-pot, the force of the steam will cause the lid, if no hole be in it, to play up and down for some time. And without the hole the tea would not pour out, for want of air above to prevent a vacuum.

Thus various ingenious answers to the queries, both in the Diary and Supplement, were given by the following ladies and gentlemen, viz. John Bayley, John Bransby, W. Butterman, John Cairns, Cara, Tho. Coulson, Tho. Coultherd, Sarah Cowen, Tho. Crosby, X. Dino, R. Dutton, J. Furnass, J. Hatfield, Miss A. H—g—t, Jos. Hindson, J. Horn, Jacobus, Wm. Marrat, Tho. Molineux, Wm. Newby, John Rimmer, Tho. Rimmer, Da. Robarts, R. Robinson, Alex. Rowe, R. Sandersen, John Savage, Tho. Scurr, R. Smithson, A. T, G. T, J. J. Thompson, Tho. Thorpe, T. Turner, Virtet, J. Walon, Eliz. Wright, &c.

NEW ENIGMAS.

I. ENIGMA, by Mr. John Brooksbank, Leicester Square.

Ye lovely fair, who grace Diaria's page,
Whose wit amuses and instructs the age,
Whose charms surpass those of the Trojan maid,
For whom Achilles stopp'd his wonted aid,
When on the Trojan plains the Grecians fought,
And Greeks and Trojans deeds of valour wrought;

Your smiles I crave, to aid me whilst I shew
My vast importance, which your smiles can do.

To poets I my aid creative lend,
E'en Homer's self did in his lines befriend;
'Twas I did first the Iliad's plan design,
And gave the author every flowing line:
Immortal Virgil—yea, great Ovid too,
“ Who all the turns of love's soft passion knew; ”
Thro' me they gain'd a wreath of lasting bays,
That shall remain to time's remotest days.—
But not to ancient bards confin'd alone;
My power the prince of bards, great Milton's shewn;
By me he told how rebel angels fell,
From heaven's high concave, to the gulph of hell;
How, 'midst the torments of the liquid fire,
The rebel leader did his host inspire:
I led the bard to heaven's imperial throne,
And so made heaven's secret counsels known;
I penetrated thro' the shades of night,
And brought th' infernal regions to his sight—
Pope, Shakespeare, Dryden, Thomson, and the rest
Of bards renown'd, were of my powers possess'd:
Hence they obtain'd an ever deathless name,
And gain'd the favour of the damsel, Fame.—
When fate ordains the lover to forego
His fair one's charms, and pangs of absence know,
Fierce racking pangs, that do his bosom tear,
I often to him bring the fair one near;
I shew the lovely fair in all her charms,
And sometimes with her bless his longing arms.
Nay, greater pleasure oft I give to man,
Than those which are by some call'd real, can.
Now, lovely fair ones, use me if you please,
Then soon this slender veil you'll read with ease;
And, me possessing, in Diaria's pages,
Record my name, which has been fam'd for ages.

II. ENIGMA, by Mr. Joseph Gilbert, of Burgh.

Ye sons of fame, who shine in Dia's page,
At once the pride and honour of the age,
Accept the tribute of my youthful muse,
Nor your attention for a while refuse.—
In early times, behold me in your view,
Ere days and nights their stated order knew,
Ere sea was subject to terrestrial bound,
When chaos reign'd in haughty state around.—

Ye mighty angels, whose presumptive pride,
 The dreadful vengeance of your God defy'd,
 You know what scenes in my dominions dwell,
 For I increase the mis'ries of your hell.—
 Doleful and sad the places I attend,
 To all the deep designs of vice a friend :
 When o'er the earth I stretch my gloomy sway,
 To what dire deeds of horror I betray,
 To daring robbers I protection lend,
 Nay, murd'ers too, I often do defend,
 By me embolden'd ; O ye mortals shrink,
 And terror seize on all, whene'er you think
 What desp'rate acts, what various sins are done,
 What fatal plots, conspiracies begun.—
 Yet to no narrow limits I'm confin'd,
 Nor earth nor hell my spreading course can bind ;
 In air high tow'ring, and extending wide,
 On winds swift pinions can securely ride.

III. ENIGMA, *by Mr. Tho. Rimmer, of Standish.*

By learned men I am minutely drawn,
 As all the world a thousand times I've shewn.
 Tho' made by man, I'm hospitable, kind,
 Instruct the trav'ler, and enlarge the mind.
 Old Gripus, to some distant city bent,
 Explores my use, my aid to him is lent,
 With safety leads him to the wish'd-for bound ;
 His stars he blesses,—all his hopes are crown'd.
 If Mammon's rich in houses, lands, and notes,
 I'm richer far, tho' worth not forty groats ;
 You'll think 'tis strange, but yet 'tis fully known,
 Whole nations, empires, states are all my own.—
 To boast of learning is both base and rude :
 I'll wave that head—tho' I know longitude.
 At school you'll find me in some useful book,
 At home, abroad, and in some cottage nook.
 Like fish, I've scales—no coats, yet diff'rent capes,
 Of various hues—of divers forms and shapes.
 I've Hollands—British—none to give a bard ;
 Invert me, ladies, I'm a faced card.

IV. ENIGMA, *by Mr. Rob. Sanderson, Steeple Aston.*

Men, by their actions, as we learn to know,
 Ladies, my name from my achievements draw.
 With power almost unlimited, I give
 Health to the sick, and bid the leprous live ;

That pow'r abus'd, I quickly snatch away
That health I gave, and bid the sound decay.
The fate of thousands hangs upon my will,
Sometimes I save a life, sometimes I kill.—

Lothario, with three thousand pounds a year,
At twenty-one began the full career
Of pleasure, fashion, gaming, drinking, strife,
That is, Lothario—enter'd into life.
Newmarket, dice, (those fiends that peace destroy,
And bid despair usurp the seat of joy,)
Now cause a throbbing in Lothario's breast,
Now first bereave him of his usual rest.
Cards, horses, dice, his time divided claim,
And bagnios echo with Lothario's name.
But view him now arriv'd at twenty-nine ;
His money gone, in debt and—a decline :
His cares to banish, creditors deceive,
Of this world he resolves to take French leave ;
To me applies, and sure assistance gets,
Then pays, with nature's, all his honour's debts.

'Tis thus I kill : but now reverse the scene.
Cecilia, lovely, blooming, and fifteen,
A putrid fever (envious of such health)
Pays a rude visit, like a thief, by stealth ;
Such ravage makes, her parents tears and sighs
Portend, Cecilia on her death-bed lies.
Her eyes their lustre lose, her body weak,
No more the rose appears upon her cheek.
My aid is ask'd ; can I that aid deny ?
Pray who can see the lov'd Cecilia die ?
Her life is doubtful, 'tis a trying hour,
I give my variously-collected power,
Rescue the maid from that rude monster death,
Chase off the fever, and recall her breath,
Bid smiling health, who then had fled the place,
Once more triumphant sit upon her face ;
Restore their usual lustre to her eyes,
Which now, whoever looks on—surely dies.—
And thus I save. But yet my pow'r is such,
That some too little use me, some too much.
Another hint, before the lyre's unstrung,
Shakespeare, my brother and his master sung.

V. ENIGMA, by *Simplicius*.

A strange, mysterious, various, curious thing,
From whence, as sages say, all creatures spring,

Appears, tho' cloath'd in enigmatic dress,
 And thus description gives in words express.
 Conceal'd from human sight by heav'n's own care,
 I sail upon the bosom of the air.
 And while within my living bark I sail,
 I fear nor wint'ry storms, or roughest gale.
 Fearless of shipwreck, I each wave defy,
 When foaming billows roar, and threat the sky.
 At length thrown out with ignominious birth,
 I've oft no other bed but parent earth.
 Yet sometimes laid within a bed of state,
 Which art can neither make nor imitate.
 Nor square nor angle in my form is found,
 And nothing like me in creation round.
 As a strong city, fenc'd on ev'ry side,
 I'm wall'd around, and wholly fortify'd,
 So firm, that Sampson's hands would prove too weak,
 Grasping me fairly round, my works to break.
 Yet, strange to tell, the gentlest force apply'd
 By female hands, will crush my strongest side.
 Then curious riches straightways I unfold;
 First, liquid silver pour, then liquid gold.
 Nay, what is more, what gold can never give,
 Health I impart, and aid you while you live.
 All this I do—and, wondrous to relate,
 Did I not meet so premature a fate,
 From my demolish'd walls strange things would rise,
 And, Phoenix-like, affect the vaulted skies.

VI. ENIGMA, *by R. W. of Red Lion Square.*

Uncertain whether the all-teeming earth,
 Or heaven's expanse ethereal gave me birth;
 How first produc'd my wondrous frame, and when,
 The philosophic sage explores in vain.
 When in my destin'd seasons I appear,
 The tribes of men admire, adore, or fear.
 Benign to some, in dreary climes, forlorn,
 I cheer their tedious hours from eve till morn.
 Some, an unusual stranger, I amuse,
 With ever varying form, and various hues;
 Such tints of jasper, sardonyx, and gold,
 As fancy gave to angel forms of old.
 Now like a silver scroll I stand above
 The earth; now gently undulating move;
 Now wide dilating, diversely I range,
 And colour, place, and form each instant change;

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Thus reigning till an only rival's hour
 Approaching, cancels my inferior power.
 Obscur'd I yield to his supreme control,
 And, chas'd by him, I fly from pole to pole.

Falsely my influence malign they blame ;—
 Heaven's feeblest ray pervades my tender frame :
 I make not men, nor cities rise, nor fall ;
 To some most useful, innocent to all.

VII. Or PRIZE ENIGMA, by *Mr. G. Young, Spalding.*
[Whoever answers it before Feb. 2, has a chance, by lot, for the
Supplementis.]

Ye lovely fair, to me attention lend,
 I usher to your view a constant friend :
 A friend who gives the warmest, kind support ;
 A friend to whom you safely may resort ;
 A friend from dawning unto closing life ;
 A friend to ev'ry man who takes a wife ;
 A friend (but am I ne'er to end this strain)
 You'll seek in anguish, sickness, sorrow, pain ;
 Nor then alone, but when health cheers the heart,
 Fly, fly to me, I further health impart.——

Read but the poet's sweet, harmonious theme,
 Attend the politician's deep-laid scheme ;
 These ne'er to full perfection had been brought,
 Had I refus'd my friendly aid to thought.
 Thus prone to strengthen and enliven wit,
 I frequent services have render'd Pitt.
 Here some exclaim—Forbear this empty prate—
 You !—you, assist a minister of state !
 You poor half-headed thing !—we truly deem
 Your aid illusion, or an airy dream !
 To these I say, Avaunt ! ye vulgar throng !
 To weigh my merits don't to you belong ;
 To weigh perfections, only seen complete,
 Where nobles fall down prostrate at my feet !
 Nor is this homage deem'd too great for me,
 To whom kings, queens, and emp'rors bend the knee !
 To whom all do, all must in turn repair,
 And none more early than the prudent fair.——
 But stop, my muse, nor let your fancy rove
 Beyond what truth itself will fairly prove :
 Truth, did I say ; and must nought else be told ?
 Alas, then—“ All that glitters is not gold.”
 O'er this bright glare of boastings must be cast
 Some sombre, nay, some bloody shades at last.

Hush truth, pray hush, in mercy do not tell,
 What seems to mark me fit alone for hell.
 Truth will not hush, the soul of guilty spare,
 But speaks of men and things just as they are;
 Says I help the adulterer's base design,
 And blushing points to an historic line,
 Where I'm accus'd, confronted, and disgrac'd,
 With killing some in my protection plac'd.—
 Here let the curtain of oblivion fall,
 These deeds for ever hide, hide me and all.

NEW REBUSES, CHARADES, AND QUERIES.

I. REBUS, by Mr. T. R. Smart.

What abounds without number on ocean's rough shore,
 The reverse of the Latin for *thing*;
 Add a father's delight, and the whole will explore
 A friend, whom with pleasure I sing;
 Whose wit can enliven, whose manners engage,
 Whose humor not cynics can blame;
 Whose verses adorn the Diarian page,
 And a monument raise to his fame.

II. REBUS, by Virtet.

I'm a word of five letters, address'd to the fair;
 Depriv'd of the first, a man's name will appear;
 Bereft of one more, you will quickly behold
 The parent of what is oft penn'd in a fold;
 Curtail'd of another, you'll presently see
 A word that is commonly used for Be.
 If any hint more needs my name to explain,
 Read forward and backward, I'm both ways the same.

III. REBUS, by Mr. Wm. Wells, of Crowle.

If after the month my lady's crown'd queen,
 You add in each week what is seven times seen,
 If rightly connected, they'll tell very clear,
 When sports in Old England do yearly appear.

IV. REBUS, by Mr. G. Young, of Spalding.

I shew to the eye what men do o'er their cups,
 When smoking tobacco and taking their sips.
 Reverse me, and there will appear in your view,
 What oft for its use is applied to the screw.

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From this word as it stands, decollate but the head,
 You'll see how long constant I'll prove when I wed.
 Again read this backward, (don't think it absurd),
 The retrogradation's an old English word.
 When thus metamorphos'd, let the head off be torn,
 'Twill name one who liv'd, without ever being born,
 Who neither had sister, kind mother or brother,
 And whose name may be read one way or t'other ;
 Sever then but her head and her tail at a blow,
 Then the number of letters at first it will show.

I. CHARADE, *by Adalina. To the Authoress of Emmaline.*

The fond affection of a married dame,
 My first without imputed guilt may claim.
 My pliant next, men use with wily care,
 And by its aid a harmless race ensnare.
 See thine, fair Charlotte, and with truth we find,
 My third, tho' fraught with woe, can charm the mind.

II. CHARADE, *by Mr. J. Brown, Schoolmaster, Surfleet.*

My first, gents and ladies, is part of your dress ;
 The drunkard exhibits my next in his face ;
 Connected together, they'll show in a trice,
 What ne'er should be harbour'd, except against vice.

III. CHARADE, *by Mr. W. Buttermann, North Cave.*

My first does oft the indigent redress,
 And comforts them amidst extreme distress :
 My next's the guardian of our sea-girt coast,
 Our nation's bulwark, and Britannia's boast :
 My whole's the greatest blessing here below,
 A fount from which the dearest pleasures flow.

IV. CHARADE, *by Mr. Rd. Humber, Brighton.*

Upon my first soft music burst ;
 My next's without an end ;
 My whole adorns Clarissa's first ;
 This mystic tale come rend.

I. QUERY, *by Mr. Wm. Francis, jun.*

What is the reason that Easter-day is on the 8th of April this year (1798), since, according to the general rule, it should be on the first, being the Sunday after the full moon that happens on, or next after the vernal equinox, which in the present instance is on Saturday the 31st of March ?

II. QUERY, by *Jacobus of Norwich.*

Quere, from whence originated the proverbial expression,
 "To bear the bell?"

III. QUERY, by *Mr. Tho. Molineux, Macclesfield.*

It is commonly asserted, that the total quantity of light and darkness allotted in the course of the year, to every region of the earth, is the same, though distributed at various times, and in different portions.—Is this assertion really true, and on what is it founded?

IV. QUERY, by *Mr. T. T—pe.*

When iron is heated red hot, and immediately cooled in water, it becomes harder; but when left to cool in the open air, softer: how is this to be accounted for?

ECLIPSES AND TRANSIT OF MERCURY.

There will be only two eclipses this year, both of the sun; but neither of them visible in these parts.—The first happens on Sunday the 5th of May, at 46 min. before one in the morning. In the great South Sea, or Pacific Ocean, this will be a great and annular eclipse.—The second eclipse happens on Monday, Oct. the 28th. at 36 min. past 5 afternoon. Though invisible here, this will be a central and total eclipse in the great South Sea or Pacific Ocean.

The planet Mercury will also transit the sun, or pass over his disc, on May the 7th. The transit begins about half-past 8 in the morning, and ends about 3-quarters past 3 afternoon; passing over the lower part of the disc.—Good eyes may see the planet pass like a small black spot over the sun: But it will be best seen by a telescope: in either case, looking through a smoked glass, to defend the eye from the sun's rays.

Jan. 16, is an occultation of Jupiter by the moon, about 2 o'clock in the morning.

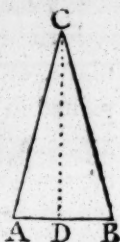
Nov. 24, is an occultation of Venus by the moon, about 4 in the morning.

N. B. The letters, post paid, must be sent so as to come to hand, at latest, before the end of April; but the sooner the better. They may be addressed either to Doctor Hutton, Woolwich; or thus, To the Author of the Ladies' Diary, at Stationers' Hall, London.

ANSWERS TO THE MATHEMATICAL QUESTIONS
PROPOSED IN THE LAST SUPPLEMENT.

I. SUPP. QUEST. (69) answered by Mr. John Bransby.

Let the triangle ABC represent the 100th part of the polygon, in which CD is perp. to AB. Then will the base AB be = 1 link = .22 yards, and the angle $ACB = 360^\circ \div 100 = 3^\circ 36'$; consequently $ACD = 1^\circ 48'$. Hence, by trigon. as tang. ACD : radius :: $AD = .11$ yd : $CD = 3.5002564$ yds; which mult. by 11, half the perimeter, the product 38.5028204 yds. is the area required.



The same answered by Mr. Joseph Brewer, of Preston.

First, $360^\circ \div 200 = 1^\circ 48' =$ half the angle at the centre, the natural co-tang. of which is 31.820516 . Then, by Dr. Hutton's Mensur. pa. 113, $\frac{1}{2} \times .22^2 \times 100 = 31.820516 \times 1.21 = 38.50282436$ square yards, the space inclosed as required.

The same, by Mr. John Cavill, of Beighton.

Gunter's chain will form a polygon of 100 sides. Therefore $360^\circ \div 200 = 1^\circ 48' =$ the angle made by a perp. from the centre on one of the sides. Then $\sin. 1^\circ 48' : \cos. 1^\circ 48' :: AD = 3.96$ inches : 126 inches = the perp. Hence, $396 \times 126 \div 144 = 346\frac{1}{2}$ feet, the area required.

The same, by Mr. Da. Robarts, of St. Columb.

It is plain that the chain is meant to form a polygon of 100 equal sides, each side 1 link. Let ABC represent one of the 100 equal parts of the polygon, whose side $AB = 7.92$ inches, or .22 yards. Now, (by Dr. Hutton's Mensur. p. 113) since $360^\circ \div 100 = 3^\circ 36' =$ angle ACB, its half $1^\circ 48' =$ angle ACD, whose compl. $88^\circ 12' =$ angle A, whose tangent is 31.820516 . Then as radius 1 : $31.820516 :: AD = .11$: $CD = 3.5$. Hence $3.5 \times .11 \times 100 = 38.5$ square yards, the area.

Nearly in the same manner was the solution also given by Messieurs M. Aspinall, B. Bevan, John Blackwell, Geo. Boulby, Wm. Burdon, Geo. Chapman, Tho. Coulson, Tho. Coulterd, Sarah Cowen, John Craggs, Rd. Dover, J. Ewbank, Wm. Francis, J. Furnass, Jos. Gittins, Ed. Grace, J. Hartley, John Hawkes, John Harrison, T. Hewitt, T. Hind, W. Hostman, J. M. Lockwood, Wm. Marrat, John Mitchell, Tho. Perroll, Ben. Richardson, Wm. Robinson, Aug. Roullier, John Rutherford, Wm. Saint, J. Shackleton, Tho. Squire, John Surtees, J. J. Thompson, Ja. Thoubren, Jon. Walton, Rob. Wilkinson, Jos. Wilson, Tho. J. Wood, Eliz. Wright, &c.

II. SUPPLEMENT QUESTION (70) answered.

Correspondents have made use of three principles of solution to this question, as will appear by the following specimen here given of each.

The Solution by Mr. James Thoubren, Lanchester.

First $12\frac{3}{5} - 5\frac{1}{7} = 7\frac{16}{35}$ the height gained in one day and night, or 24 hours; therefore $7\frac{16}{35} \times 11 = 82\frac{16}{35}$ the height gained in 11 such days and nights; to which add $\frac{1}{2}$ of $12\frac{3}{5}$ or $4\frac{1}{5}$, the gain in $\frac{1}{3}$ of a day, makes $86\frac{8}{35}$ the height of the maypole as required.

The same, by Mr. Tho. Perroll, of Hull.

First, $12\frac{3}{5} - 5\frac{1}{7} = 7\frac{16}{35}$ the gain of the day over the night; which multiplied by the whole time $11\frac{1}{3}$, gives $7\frac{16}{35} \times 11\frac{1}{3} = 84\frac{18}{35}$, the whole height of the maypole.

The same, by Mr. Wm. Burdon, of Acafter Malbis.

First, $12\frac{3}{5} - 5\frac{1}{7} = 7\frac{16}{35}$ feet, the height gained each day for $10\frac{1}{3}$ days; then $7\frac{16}{35} \times 10\frac{1}{3} = 77\frac{2}{35}$ is the height gained in that time; and the last day he gained $12\frac{3}{5}$; therefore $77\frac{2}{35} + 12\frac{3}{5} = 89\frac{23}{35}$ feet, is the height of the pole.

And according to one of these ways was the solution given by Messrs. Aspinall, Bevan, Blackwell, Boulby, Bransby, Brewer, Cavill, Chapman, Coulson, Coulter, Cowan, Craggs, Dover, Evans, Ewbank, Francis, Furnass, Gittins, Grace, Hartley, Hawkes, Herriott, Hind, Harrison, Hostman, Lees, Lefiter, Lockwood, Marrat, Middleton, Mitchell, Rimmer, Roberts, Robinson, Roullier, Rutherford, Saint, Shackleton, Suxtees, Thompson, Walton, Wilkinson, Wilson, Wood, Wright, &c.

III. SUPP. QUEST. (71) ans. by Mr. J. Hawkes, Finedon.

By similar triangles, as the height of the pole is to that of the steeple, so is the shadow of the former to that of the latter; that is, as $50\frac{1}{2} : 300\frac{7}{8} :: 98\frac{1}{2} : 581\frac{387}{88}$; hence $581\frac{387}{88} - 20\frac{1}{2} = 530\frac{637}{244}$, the breadth of the river sought.

The same, by Mr. T. Hind, at Mr. Shepherd's Boarding-school, Layton, Essex.

As 50 feet 11 inches : 98 feet 6 inches :: 300 feet 8 inches : 581.64975 = the whole length of the shadow of the steeple; also $20.5 + 30.75 = 51.25$; therefore $581.64975 - 51.25 = 530.39975$, is the breadth of the river.

The same, by Mr. Tho. Coulter, of Frosterly.

As 50 ft. 11 inc. : 98 ft. 6 inc. :: 300 ft. 8 inc. : $581\frac{1}{2}$ ft. $74\frac{1}{2}$ inc. the whole length of the steeple's shadow; from which de-

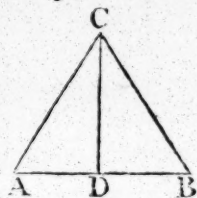
duct 51 ft. 3 inc. then the remainder 530 ft. $4\frac{8}{11}$ inc. will be the breadth of the river required.

Note. This question has been copied verbatim from Vyse's Tutor's Guide, being the 40th question in the Rule of Three. Also the general answer to the enigmas, by the proposer of this question, in the last year's Diary, was taken from the Arminian Mag. vol. 8, pa. 444.

This question was also answered by Messieurs Ashcroft, Aspinall, Bevan, Blackwell, Boulby, Bransby, Brewer, Burdon, Cavill, Chapman, Sarah Cowen, Craggs, Dover, Ewbank, Francis, Furnass, Gittins, Grace, Hartley, Harrison, Hewitt, Hostman, Lees, Lefiter, Lockwood, Marrai, Mitchell, Perroll, Rimmer, Roberts, Robinson, Roullier, Rutherford, Shackleton, Squire, Surtees, Thompson, Thoubren, Walton, Wilkinson, Wilson, Wood, Eliz. Wright, &c.

IV. SUPP. QUEST. (72) *ans. by Mr. J. Hartley, London.*

It is evident that the triangle most in favour of the sweep, is the isosceles one ACB, and the perpendicular CD on the middle of the base AB. Make $CD = 80$ yards $= a$, and $AD = x$. Then, as 3 jumps are equal to 4 steps, and 2 steps taken to 1 jump, it follows that the rate of their speed, is as 6 to 4, or as



3 to 2. Now $2x = AB$ the base, $\sqrt{a^2 + x^2} = AC$ one side, or $2\sqrt{a^2 + x^2} =$ both the sides; hence $2 : 3 :: 2x : 2\sqrt{a^2 + x^2} - 2$, which gives $3x = 2\sqrt{a^2 + x^2} - 2$, a quadratic equation in which $x = 70.358$ yards $= AD$. Hence $AB = 140.716$ yards jumped by the tinker; and $2\sqrt{a^2 + x^2} - 2 = 211.076$ yards run by the sweep.

The same, by Mr. J. M. Lockwood, at the Rev. Mr. Vincent's Academy, Leeds.

An isosceles triangle will be the most in the sweep's favour; because the sides of any other triangle, having the same height, will exceed those of the isosceles one.—From the data, the ratio of their motions is found to be as 2 to 3. Therefore, let the isosceles triangle ABC represent their courses, and $AD = x$; then $2 : 3 :: x : \frac{3}{2}x =$ the space passed over by the sweep during the time that the tinker moved from A to D; but by the question $\frac{3}{2}x + 1 = AC$; and by Eucl. 47. 1, $(\frac{3}{2}x + 1)^2 - x^2 = 6400$; this equation gives $x = 70.359 = AD$ or DB ; therefore $AB = 140.718$ yards, the length of the tinker's course; and from what is done above, AC is found $= 106.538$, theref. $2AC = 213.076$, the length of the sweep's course.

The same, by Mr. John Mitchell, Pleasington school.

Let ABC represent the given triangle. It is plain that the

sides AB, BC must be equal, to be the least. First, as $4 : 3 :: 2 : \frac{3}{2}$ the ratio of their speed, viz. the sweep steps 3 yds. while the tinker jumps 2. Let $2x = AD$; then $3x + 1 = AC$. Put $a = 80 = CD$. Then $AD^2 + CD^2 = AC^2$, viz. $9x^2 + 6x + 1 = 4x^2 + a^2$, hence $5x^2 + 6x + 1 = a^2$, and $x = 35.1793$; consequently $4x = 140.7172$ yards, jumped by the tinker; and $6x = 211.0758$ yards run by the sweep.

This question was also answered by Messrs. Aspinall, Bevan, Boulby, Bransby, Brewer, Burdon, Cavill, Chapman, Coulterd, Cowen, Craggs, Francis, Furnass, Gittins, Hawkes, Hewitt, Harrison, Perroll, Robinson, Rutherford, Surtees, Thoubren, Wilson, Wooldridge, El. Wright, &c.

V. SUPP. QUEST. (73) *ans. by Mr. John Rees, Bristol.*

Put $x = \sin.$ sun's altitude, $s = \sin.$ declination, $r = \text{radius}$.

Then, by spherics, $x : r :: s : \frac{s}{x} = \sin.$ lat., theref. $1 + \frac{s^2}{x^2} = x^2$;

hence $x = \sqrt{\frac{1}{2} - \sqrt{\frac{1}{4} - s^2}} = \sin. 26^\circ 23' 43''$ the altitude, and conseq. its comp. $63^\circ 36' 17''$ is the latitude sought.

The same, by Mr. Aug. Roullier.

Put $a = .39816$ the sine of $23^\circ 27\frac{1}{2}'$ the sun's declin. for the given day; $z = \sin.$ of the sun's altitude when due east; $x = \sin.$ of the lat.; then, from the question $z = \sqrt{1 - xx} = \cos.$ of the lat. Hence, by spherics, $x : a :: 1 : \sqrt{1 - xx}$; conseq. $x = \sqrt{\frac{1}{2} \pm \sqrt{\frac{1}{4} - a^2}} = \sin.$ of the lat. $63^\circ 37'$.

The same, by Mr. Tho. Squire, of Aftwick.

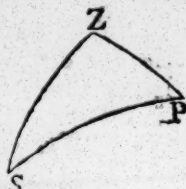
Let $a = .3982155$ the sine of $23^\circ 28'$, the sun's declin. for the given day, to radius 1; and $x = \sin.$ of the latitude. Then $\sqrt{1 - x^2}$ is the sine of the sun's altitude; and, by spherics, as $x : a :: 1 : \sqrt{1 - x^2}$; hence $x = \sqrt{\frac{1}{2} + \sqrt{\frac{1}{4} - a^2}} = .89577$, the sine of $63^\circ 36'$, the latitude.

Answers to this question were also given by Messrs. B. Bevan, John Blackwell, J. Bransby, Jos. Brewer, Wm. Burdon, John Cavill, Geo. Chapman, Tho. Coulterd, Sarah Cowen, John Craggs, Rev. J. Ewbank, Rev. J. Furnass, John Harrison, J. Hartley, John Hawkes, Da. Henry, T. Hewitt, Wm. Marrat, John Mitchell, Tho. Perroll, Robinson, Rutherford, John Surtees, Ja. Thoubren, W. Truman, Rob. Wilkinson, Jos. Wilson, Eliz. Wright, &c.

VI. SUPP. QUEST. (74) *ans. by Mr. John Craggs, Hilton.*

As $2 : 1 :: \text{radius} : \text{tang. of altitude of the sun's upper limb} = 26^\circ 33' 54''$; by subtracting $15' 59'' 13'''$ and $1' 44'' 28'''$ for semidiameter and refraction, and adding $7'' 54'''$ for parallax, gives $26^\circ 16' 8'' 26'''$ for the true altitude of his cen-

res. Then, in the oblique spherical triangle SZP, there are given the colat. $ZP = 35^{\circ} 30'$, the coalt. $ZS = 63^{\circ} 43' 51'' 34'''$, and the co-declin. $PS = 81^{\circ} 24'$; to find the angle $P = 55^{\circ} 23' 42'' 64$ answering to 3 h. 41 m. 35 sec. the time before noon; this taken from 12 h. leaves 8 h. 18 m. 25 sec. in the morning, apparent time.



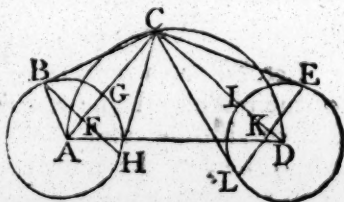
The same, by Mr. Geo. Chapman and Mr. John Harrison, at Mr. Johnson's School, Frosterly.

There is no occasion for the height of the man to be added to the data, for as $2 : 1 :: \text{radius} : .5$ the natural tangent of $26^{\circ} 33' 54''$; and when $17' 57''$ is deducted from it, for semidiameter and refraction, the remainder $26^{\circ} 15' 57''$ will be the true height of the sun's centre. Hence, in the spherical triangle SZP, having the three sides given, the angle ZPS is readily found, equal to $56^{\circ} 2'$, answering to 3 h. 44 min. before noon.

This question was also answered by Messrs. Bevan, Blackwell, Boulby, Bransby, Brewer, Burden, Cavill, Coultherd, Sarah Cowen, Ewbank, Furness, Hartley, Hawkes, Henry, Hewitt, Marrat, Mitchell, Perroll, Rees, Roberts, Robinson, Roullier, Rutherford, Squire, Surtees, Thoubren, Truman, Wilkinson, Wilson, Eliz. Wright, &c.

VII. SUPP. QUEST. (75) ans. by Mr. Jos. Brewer, Preston.

Let ADC be the semicircular garden, C the required point, CB, CH, CE, CL, tangents to the two globes, and the same all round them, inclosing the two spherical segments BGHF and EILK, the surfaces of which are to be equal, by the question.



Now put $a = AD = 75$ feet, AG being $1\frac{1}{2}$, and $DI = 1$; also put $x = AC$ the one distance; then $CD = \sqrt{a^2 - x^2}$ the other distance. Hence, by sim. triangles, $AC : AB$, or $AG :: AB : AF$, and $CD : DI :: DI : DK$, these give $AF = \frac{9}{4x}$, $DK = \frac{1}{\sqrt{a^2 - x^2}}$, hence $FG = \frac{3}{2} - \frac{9}{4x}$, and $IK =$

$1 - \frac{1}{\sqrt{a^2 - x^2}}$ the heights of the two segments. Now, by

Dr. Hutton's Mensur. p. 199, 2d edit. the surface of a segment is as the rectangle of the radius of the sphere and height of the segment, therefore $(\frac{3}{2} - \frac{9}{4x}) \times \frac{3}{2} = 1 - \frac{1}{\sqrt{a^2 - x^2}}$ and

equation of the 4th power, in which $x = 2.671502 = AC$, the one distance; consequently $CD = \sqrt{a^2 - x^2} = 74.9524$, is the other.

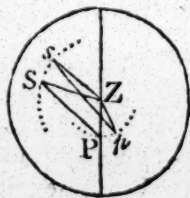
The same, by Mr. Tho. Coultherd, Frosterly.

Let $a = AD = 25$, $b = AG = 1\frac{1}{2}$, $p = 3.1416$, and $x = AC$. Then, as $AC : AB :: AB : AP = bb \div x$, and $AG - AP = b - bb \div x = PG$ will be the height of the segment BGH; hence its superficies is $(2pb^2x - 2pb^3) \div x$. Again, $\sqrt{AD^2 - AC^2} = CD = \sqrt{aa - xx}$; and as $DI : DL :: DL : DK = 1 \div \sqrt{aa - xx}$; hence $IK = 1 - 1 \div \sqrt{aa - xx}$ the height of the segment seen of the left ball, and its curve surface is $2p - 2p \div \sqrt{aa - xx}$. Consequently $\frac{b^2x - b^3}{x} = 1 - \frac{1}{\sqrt{aa - xx}}$ by the question: from which equation is found $x = 2.6715$ feet $= AC$; then the distance CD from the other ball is 74.952 feet.

Ingenious answers to this question were also given by Messrs. Aspinall, Bevan, Blackwell, Bransby, Burdon, Cavill, Chatman, Cowen, Craggs, Ewbank, Furnass, Harrison, Hartley, Hewitt, Marraitt, Mitchell, Rees, Rimmer, Robinson, Roullier, Rutherford, Surtees, Theubren, Truman, Wilson, Wright, &c.

VIII. or PRIZE SUPP. QUEST. (76) answered by the
Rev. Mr. L. Evans, of Froxfield.

Let ZP be a portion of the true meridian of the place; SP the sun's co-declination, SZ his co-altitude, and the angle PZS his true azimuth from the north. Conceive the pole P to be removed to the position p parallel to the horizon, making the angle $PZp = 17^\circ 30'$ the declination of the window to the east. The place of the sun S will now appear at s , the angle SZs will be equal to PZp , and the angle Zps will be the hour angle which the dial exhibited $= 11^\circ 15'$. Now, let e and d denote the sine and cosine of $Zp = ZP$ the co-latitude $= 37^\circ 35'$; p and i the sine and cosine of $SP = 81^\circ 15'$; s and c the sine and cosine of $PZp + SZs = 35^\circ$; t the cotang. of the angle $Zps = 11^\circ 15'$; and x and $-y$ the sine and cosine of SZP ; then will the sine of the angle sZp be $= cx - sy$, and its cosine $= sx - cy$; also, by spheric trigon. $(tcx - tsy - ecy - esx) \div d = \cotang. Zs$, and $(-dey - pi \sqrt{1 - \frac{d^2x^2}{p^2}}) \div (d^2 - p^2) = \cotang. ZS$. These two cotangents being put equal to ach



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&c.

No. 12. Supp. Questions answered. 39

other, gives a quadratic equation, in which the value of x is $7555091 = \text{nat. sine of } 130^\circ 55' 49''\frac{1}{2}$. Hence $SZ = 53^\circ 22' 13''\frac{1}{2}$, and the polar distance $SPZ = 37^\circ 50' 19''$, answering to 9 h. 28 m. 31 sec. the time sought.

The same, by Mr. Wm. Francis, jun. Brentford.

Let ZP represent a portion of the meridian of the place, and Zp that of the dial when placed against the window: then the true place of the sun S will appear to be removed to s , making the arcs ZS and Zs equal.

In the figure are given, $Zp = ZP = 37^\circ 35'$, $SP = 81^\circ 15'$, the angle $PZp = SZs = 17^\circ 30'$, and the angle Zps the hour angle of the dial $= 11^\circ 15'$; to find the true hour angle ZPS .

Now suppose the angle SZP to be 130° . Then, by spheric trigon. the side ZS will be found $= 48^\circ 42' 22''$, and the side $Zs = 53^\circ 46' 12''$, making an error of $5^\circ 3' 50''$ too little.

Next suppose the angle SZP to be 131° . Then will $ZS = 53^\circ 44' 40''$, and $Zs = 53^\circ 20' 32''$, making an error of $24' 8''$ too great.

Then, by the rule of position we find $130^\circ 55' 36''$ to be an approximate value of SZP for the next supposition. And by proceeding in this way we find the angle SZP to be $130^\circ 56'$ nearly. Hence the angle $ZPS = 37^\circ 50' = 2 \text{ h. } 31\frac{1}{2} \text{ m.}$ the true time required.

The same, by Mr. J. Hartley, Auditor's Office.

The shadow of the gnomon, when the dial was placed in the window, was, by the question, at 15 m. past 11 o'clock. To find that hour angle, say, as radius : sine of latitude ($52^\circ 25'$) :: tangent of the hour arch ($11^\circ 15'$) : tang. of the hour angle $= 8^\circ 47'$; to which, adding the declination east ($17^\circ 30'$) gives $26^\circ 17'$ the hour angle at the time required. From the same proportion, as sine of lat. ($52^\circ 25'$) : radius :: tang. of hour angle ($26^\circ 17'$) : tang. of hour-arch $= 31^\circ 35'$; which changed into time, and subtracted from 12 hours, gives 9 h. 52 m. 56 sec.; to this, adding the equation 32 sec. gives 9 h. 53 m. 28 sec. for the true time.

Ingenious answers to this curious question were also given by Messrs. M. Aspinall, B. Bevan, John Bransby, Wm. Burdon, John Coulterd, Tho. Coulterd, Sarah Cowen, John Craggs, Rev. J. Furnass, Da. Henry, T. Hewitt, Maria Middleton, John Mitchell, John Rees, Aug. Roullier, John Rutherford, Rev. Tho. Scurr, Rd. Smithson, Thomas Squire, John Surtees, Jos. Wilson, Tho. Woolffen, Eliz. Wright, &c.

DIARY QUESTIONS ANSWERED.

I. DIARY QUEST. answered by Mr. Wm. Saint, Norwich.

Let x and z represent the two numbers. Then, per quest. $xz = x^2 - z^2 = x^3 \div z^3$. From the second of these equations $x = z^2$; which, substituted for x in the first, gives $z^3 = z^4 - z^2$, or $z = z^2 - 1$; hence, by transposition and completing the square, &c, the root z is found = 1.6180339, and then $x = 2.6180339$, the required number.

II. DIARY QUEST. ans. by Miss Eliz. Wright, Flaxton.

Here are given the three sides of the triangle EAB, [See the fig. in the Diary this year,] to find the natural sine of the angle EBA = .81412. Now in the triangle EBC, we have EB, BC, and the included angle, to find EC = 24.54 chains. Then, by Mensur. pa. 96, rule 2, the contents of the triangles EAB and EBC are 98.50825 and 35.82128 chains; also, by pa. 97, rule 3, that of EDC is 92.8043; the sum of which divided by 10, &c, gives 22 Ac. 2 R. 34 P.

III. DIARY QUEST. ans. by Mr. Tho. Jackson Wood, Bury.

Let fall the perp. CF and DG, which call x [See fig. in the Diary]; and put the area = a , also AB = 1432 links = b , sine angle A = $34^\circ 17' = s$, its cosine = w , sine B = $54^\circ 18' = t$, its cosine = v . Then $AF = \frac{wx}{s}$, $BG = \frac{vx}{t}$, $CD = b - dx$ (putting $\frac{wx}{s} + \frac{vx}{t} = dx$). Again, by Dr. Hutton's Mensur. pa. 74, $2b - dx \times x = 2bx - dx^2 = a$. Hence $x = 233.7214$ links. Again, by Trigonometry,

$s : x :: 1 : \frac{x}{s} = AC = 414.9242$, and $t : x :: 1 : \frac{x}{t} = BD = 287.815$. Then $CD = b - dx = 921.218$, and the perimeter $AB + AC + CD + BD = 3055.9572$ links, or 122.2383 rods, which at 6d. per rod come to 3l. 1s. 1½d. nearly, the answer.

IV. DIARY QUEST. answered by Mr. J. M. Lockwood.

Here are given AD = 8, CD = 20, and the angle ADE = 58° [See the fig. in the Diary]; hence the angle BAD = 32° , and by trigon. DE = 4.2393544, and AE = 6.7843848; then AB = 13.5687696, and CE = 24.2393544, and the content is 1168.346. Again, in the right-angled triangle CEB, are given two sides, to find the $\angle B = 74^\circ 22'$, and the $\angle F$

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$= 73^{\circ} 38'$; then in the triangle AFB are given all the angles and side AB, to find $AF = 13.61865$, from which take AD, and the remainder is $5.61865 = DF$; then, by similar triangles, as $AD : AE :: DF : GF = 4.76488$, theref. $HF = 9.52976$. Also (by Dr. Hutton's Conics) the conjugate axe of the elliptic section is $= \sqrt{AB \cdot HF} = 11.371328$. Again, by similar triangles, as $AD : DE :: CD : CI = 16.960962 =$ height of the oblique cone ACF; hence its solidity is 687.6467 . And therefore the diameter of the globe will be $\sqrt[3]{\frac{687.6467}{3.1416}} = 6.026$.

V. DIARY QUEST. answered by Mr. Alex. Rowe.

Put the vessel's solidity $= 8.67$ feet $= 14981.76$ cubic inch. $= s$, its depth 21 inches $= d$, $AB = 7x$, and $CD = 5x$ [See the fig. in this year's Diary]. Then, by Dr. Hutton's Compend. Measurer, pa. 132, $49x^2 + 35x^2 + 25x^2$ or $109x^2 \times d \times .2618 = s$, and hence $x = \sqrt{s \div 28.5362d} = 5$ inches. Hence $AB = 35$, and $CD = 25$ inches.—Now let y = the globe's diameter; then, by the before cited book, p. 136, 137, the convex surface is $3.1416y^2$, and the solidity $.5236y^3$, therefore by the quest. $.5236y^3 = 2.5 \times 3.1416y^2$; from hence $y = 15$ inches.—Again, by similar triangles, as $HD = 21 : HB = 5 :: KD = 15 : KF = 3\frac{4}{7}$, and hence $EF = 32\frac{1}{7}$ inches. Conseq. by the first theorem, the capacity of EFDC is 9667.232148 cubic inches; from which deduct the solidity of the globe $= 1767.15$, and there remains 7900.08214 cubic inches, or $34\frac{1}{2}$ wine gallons nearly, as required.

The same, by Mr. Jonathan Walton, of Nest.

Let $7x$ and $5x$ denote the two diameters. Hence the solidity of the frustum $= 599.2602x^2 = 14981.76$ by the question; which gives $x = 5$ inches nearly. Conseq. the two diameters are 35 and 25.—Again, for the diameter of the globe put z : then its solidity is $.5236z^3 = \frac{5.5}{7}z^2$ by the question; which gives $z = 15$ inches, the diameter of the globe.-----Hence $35 - 25 \div 21 = .476 \times 15 = 7.14 + 25 = 32.14$, the diameter of the frustum at the surface of the wine; and its solidity $= 7899.082$, from which taking 1767.15 the solidity of the globe, leaves the content of the wine $= 34.2$ wine gallons.

VI. DIARY QUEST. answered by Mr. Wm. Francis, jun.

By geometry, the segments of the base having the same ratio as the sides about the bisected angle, the sines of the angles at the base will also have the same ratio. Hence, by trigonom.

as $5 + 4 = 9 : 5 - 4 = 1 :: \text{tang. } \frac{1}{2} \angle a + \frac{1}{2} \angle c = 60^\circ : \text{tang. } \frac{1}{2} \angle a - \frac{1}{2} \angle c = 10^\circ 54'.$ Then $60^\circ + 10^\circ 54' = 70^\circ 54' = \angle e \text{ or } C,$ and $60^\circ - 10^\circ 54' = 49^\circ 6' = \angle a \text{ or } A.$ [See fig. in Diary.]

Then, as $\text{fin. } C : BD :: \text{fin. } DBC : DC = 8.466 :: \text{fin. } D : BC = 16.63,$ and, as $\text{fin. } A : BD :: \text{fin. } ABD : AD = 10.583 :: \text{fin. } D : AB = 20.79.$ Hence the area $= AB \times BC \times \frac{1}{2} \text{ fin. } \angle B = 149.649.$

The same, by Mr. T. Hickman, of Woburn.

Constr. Draw AB, BC making the given angle, in which take $Ba = 5,$ and $Bc = 4,$ and join $ac.$ Bisection the angle B with the line $BD = 16,$ and through D draw AC parallel to $ac,$ forming the required triangle ABC.

Calcul. In the triangle aBc are given two sides, and the included angles a and $c = 49^\circ 6'$ and $70^\circ 54',$ and the side $ac = 4.5823;$ which divide in the given ratio; then in either of the triangles $aBd, cBd,$ are given all the angles and two sides, to find $Bd = 3.8488.$ Hence, by sim. triangles, as $Bd : BD :: ac : AC = 19.049 :: aB : AB = 20.785 :: Bc : BC = 16.628.$ Now, by the rule in Dr. Hutton's Mensur. pa. 67, quarto edit. $AB \times BC \times \frac{1}{2} \text{ fin. } \angle B = 149.65$ nearly, the area of the triangle sought.

The same, answered by Mr. John Ryley.

After constructing the triangle as above, Mr. Ryley makes the calculation in this manner. In the triangle $aBc,$ two sides aB, Bc and the included angle are given, to find the third side $ac = \sqrt{21};$ hence $ad = \frac{5}{9} \sqrt{21},$ and $dc = \frac{4}{9} \sqrt{21};$ also $Bd = \sqrt{aB \cdot Bc - ad \cdot dc} = \frac{2}{3} \sqrt{3}.$ —Now, by sim. triangles, as $Bd : BD :: ac : AC = \frac{2}{3} \sqrt{3} : 16 :: \frac{5}{9} \sqrt{21} : aB :: \frac{4}{9} \sqrt{21} : Bc :: aB : AB = 12 \sqrt{3} = 20.7846 :: Bc : BC = \frac{4}{5} \sqrt{3} = 16.62768;$ theref. $AB \cdot BC \cdot \frac{1}{4} \sqrt{3} = 86 \frac{2}{3} \sqrt{3} = 149.64919,$ the area sought.

VII. DIARY QUEST. *anf. by Mr. John Craggs, of Hilton.*

By pa. 493 Emerson's Miscel. or by pa. 229, vol. 2, Hutton's Diarian Miscel. it is, as $\text{tang. } 9^\circ : \text{radius} :: \text{fin. declin. } 7^\circ 36' : \text{fin. lat. } 56^\circ 37' 10'',$ where the duration of twilight is the shortest on the 12th of Oct. 1798.—Now, in the triangle $ZP\odot$ (fig. in Diary), are given the three sides, to find the angle $ZP\odot = 100^\circ 40' 49''.$ And in the triangle ZPS are given the three sides, to find the angle $ZPS = 101^\circ 34' 34''.$

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No. 12. Diary Questions answered. 43

Their difference is $53' 45''$, in time 3 m. 35 sec. of rising out of the horizon.

But, by allowing for semidiameter, refraction, and parallax, the time comes out 4 min. 22 sec.

VIII. DIARY QUEST. *ans. by Mr. T. Coultherd, Frosterly.*

Put a for the area of the aperture, w the weight of water caught in the vessel, $b = 1000$ ounces, or weight of a cubic foot of water, and $d = 1728$ inches, in a cubic foot. Then, as $b : d :: w : dw \div b$ the content in inches of the water caught in the gage; and $dw \div ab$ the depth required.

N. B. To have had a general theorem, the aperture of the vessel must be circular, and the angle, at which the rain falls, considered; neither of which circumstances are mentioned in the question.

The same, by Mr. John Surtees, of Alstone.

Let x be the depth required, a the area of the aperture (a circle), both in feet, s the sine of the angle the falling rain makes with the plane of this circle, w the weight of a cubic foot of water, and m the weight of water caught, both in pounds. Then is $axsw = m$, and $x = m \div asw$ feet, the depth required.

The same, by Mr. T. Molinoux, the proposer.

Put $a =$ the area of the aperture, b the weight of a cubic foot or 1728 inches of water, c the weight of the water caught in the vessel, and x the required depth of the water fallen, in inches.

Then, as $b : 1728 :: c : 1728c \div b$ the cubic inches of water caught; and ax denotes the same quantity; therefore $ax = 1728c \div b$, and $x = 1728c \div ab$. Hence the perpendicular height of water which falls on the ground, may be ascertained from the abovementioned data.

REMARK. In order to construct a table of heights, corresponding to different weights of water, in ounces and pounds troy, for a gage whose aperture is a square foot, in inches and decimal parts, it will be necessary to ascertain the weight (troy) of a cubic foot of water. Now from the best experiments it appears, that the cubic foot of water weighs 1000 ounces avoirdupois, (see Dr. Hutton's Dictionary, vol. 2, art. Water), $= 911\frac{1}{2}\frac{1}{4}$ ounces troy. Then, supposing the weight of water caught to be 1 ounce troy, the corresponding height, as per theorem, will be $1728 \times 1 \div 144 \times 911\frac{1}{2}\frac{1}{4} = 12 \div 91\frac{1}{2}\frac{1}{4}$

$= .09216 \div 7$, or $.0131657\frac{1}{7}$. From this result the annexed Table is constructed.

Weight. oz. troy.	Corresponding height. Inches.	Weight. lb. troy.	Corresponding height. Inches.
$\frac{1}{2}$.0032914	1	.1579886
$\frac{1}{2}$.0065828	2	.3159771
1	.0131657 $\frac{1}{7}$	3	.4739657
2	.0263314	4	.6319543
3	.0394971	5	.7899429
4	.0526629	6	.9479314
5	.0658286	7	1.1059200
6	.0789943	8	1.2639086
7	.0921600	9	1.4218971
8	.1053257	10	1.5798857
9	.1184914	11	1.7378743
10	.1316571	12	1.8958629
11	.1448220		

X. DIARY QUEST. answered by Mr. W. Burdon.

Analysis. By the question

$$\frac{AC^2}{BC^2} : \frac{AC^3 + BC^3}{AC^3 - BC^3} :: 171 : 140 :: 19 \times 9 : 35 \times 4 :: \frac{9}{4}$$

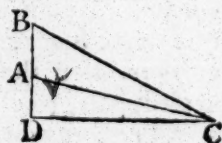
$$= (\frac{3}{2})^2 : \frac{35}{9} = \frac{27 + 8}{27 - 8} = \frac{(\frac{3}{2})^3 + 1}{(\frac{3}{2})^3 - 1}, \text{ from which it evi-}$$

dently appears that $AC : BC :: 3 : 2$ [Fig. in Diary]. Again, by the quest. $\frac{1}{2}AB \times CD : AB^2 :: 1 : 2$, hence $CD : AB :: 1 : 1$; therefore the perp. $CD = AB$ is given, and consequently the triangle is easily constructed.

XII. DIARY QUEST. answered by Miss Maria Middleton, Eden, near Durham.

Here are given, the latitude $= 54^\circ 40'$ north, the sun's horary distance from the meridian $= 15^\circ$, and his declination (1 Aug. 1796) $= 17^\circ 48' 40''$ north; to find the sun's altitude $= 51^\circ 23' 5''$, or of his upper limb $= 51^\circ 39'$; and azimuth from the meridian $= 23^\circ 16' 10''$. Then,

Case 1. If the plane incline in the direction of the shadow, it will be, as sine $\angle BCA (= 51^\circ 39' - 20^\circ) = 31^\circ 39'$: $AB = 20$ yards (the tree's height) $::$ cof. of alt. or fin. $\angle CBA : AC = 23^\circ 73'$ the length of its shadow.



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hence $x^2 - 66x - \frac{a}{b}x = -1080$, where $x = 2.32319$ inches.

N. B. This answer differs from that given in the Select Exercises only $\frac{1}{20}$ of an inch, which small difference has probably arisen from the difference of specific gravity used.

XV. or DIARY PRIZE QUESTION, answered by Mr. J. Faur, Schoolmaster, Barby.

This question amounts to this, to construct a triangle, whose sides are given, and the solid contained under the base and square of the perp. a maximum. — Put $a =$ half the greater of the two given sides, $s =$ half their sum, $d =$ half their difference, and $x =$ half the base; then $x : s :: d : ds \div x = m \div x = \frac{1}{2}$ the difference of the segments; therefore $4a^2 - (x + m \div x)^2 =$ the square of the perp. which multiplied by x gives $4a^2x - x(x + m \div x)^2$ a maximum, the fluxion of which made $= 0$, and reduced, gives $3x^4 - 2m - 4a^2 \cdot x^2 + m^2 = 0$, from which the triangle may readily be constructed.

The same, by Mr. John Hawkes, of Finedon.

Put s and d for the sum of the squares and the difference of the squares, of the two given sides, and $x =$ the base or third side of the triangle; then will $\sqrt{\frac{1}{2}s - \frac{1}{4}x^2 - \frac{1}{4}d^2 \div x^2}$ be the perp. therefore $\frac{1}{2}x \sqrt{\frac{1}{2}s - \frac{1}{4}x^2 - \frac{1}{4}d^2 \div x^2}$ the area; hence $\frac{1}{4}sx - \frac{1}{8}x^3 - \frac{1}{8}d^2 \div x$ is the solidity of the prism a max. by the question, or $sx - \frac{1}{2}x^3 - \frac{1}{2}d^2 \div x$ a max. which being put into fluxions and reduced, gives the quadratic equation $3x^4 - 2sx^2 = d^2$, the root of which is easily found by completing the square, &c.

The same, by Mr. Henry Hunter, of Alnwick.

Let a and b denote the two given sides, and x the base. Then, $x : a + b :: a - b : (a^2 - b^2) \div x$ the diff. of the segments; hence $\frac{1}{2}x + (a^2 - b^2) \div 2x$ is the greater segment, and $a^2 - (x^2 + a^2 - b^2)^2 \div 4x^2$ the square of the perp. consequently $4a^2x - (x^2 + a^2 - b^2)^2 \div x =$ a max. which being put into fluxions, and reduced, gives $3x^4 - (a^2 + b^2) 2x^2 = (a^2 - b^2)^2$, or $3x^4 - 2s^2x^2 = d^4$, where $s^2 = a^2 + b^2$ the sum of the squares of the two sides, and $d^2 = a^2 - b^2$ the difference of the squares of the same. The resolution of which quadratic equation will determine the triangle as required.

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The same, by Mr. Joseph Mouldale, of Runcorn.

Let a and b denote the two given sides of the triangle, and x the perp. then the segments of the base are $\sqrt{a^2 - x^2}$ and $\sqrt{b^2 - x^2}$, and, by the nature of the question, $x^2 \sqrt{a^2 - x^2} + x^2 \sqrt{b^2 - x^2}$ is to be a maximum. This in fluxions, and reduced, gives $3x^4 - 4sx^2 + 4a^2b^2 = 0$, where $s = a^2 + b^2$. The root of which quadratic equation will determine the question.

NEW QUESTIONS.

I. QUEST. (77) by Miss Sarah Cowen, Helmsley.

If the extreme point of the minute hand of a watch go or pass over 867'3472 yards, in the course of a year, or 365 days; it is required to find the length of the said hand, supposing the watch to keep true time.

II. QUEST. (78) by Mr. Tho. Crosby, of York.

A certain gentleman of York has a house of three stories high. He has also a ladder which will reach to the top of the third story when placed 15 feet from the bottom of the building; and it is known that another ladder, 10 feet shorter than the former, will reach to the top of the second story when fixed in the same place. Query, the length of each ladder, and the height of the house, supposing all the stories of equal altitude.

III. QUEST. (79) by Mr. John Hawkes, of Finedon.

Measuring a rectangular cistern, whose length, breadth, and depth, are in arithmetical progression, I observed, if each dimension were increased by the common difference, the capacity or content of the cistern would be increased by 576 ale gallons; but if each dimension were lessened by the same, the content of the cistern would be diminished by 288 gallons. Required the true dimensions and content.

IV. QUEST. (80) by Mr. Rd. Dover, Workington.

It is proposed to find the side of a pentagon, having its area equal to the surface of a dodecaedron, whose linear side is 16 inches: And to give a general rule for finding the side of any regular polygon, when the area is given.

V. QUEST. (81) by Mr. Alex. Rowe, Reginnis.

What annuity, or yearly income, during the life of a person of 45 years of age, can be purchased for 200l. allowing 4 per cent. per annum compound interest?

VI. QUEST. (82) by *Mr. Wm. Newby, of Barningham*

Two boys, amusing themselves at a game called snatch-apple, in a room 10 feet high, find that, by standing 9 feet from each other, the apple, which is suspended from the ceiling by a string, and in a line between them, when set agoing, just touches each of their mouths. Now it is required to find the area of the sector described by the string and apple in so doing; the perpendicular height of one boy's mouth from the ground being $4\frac{1}{2}$ feet, and that of the other 5 feet.

VII. QUEST. (83) by *Mr. James Thoubren, Lanchester School.*

An English sloop took a Spanish prize, having a piece of pure silver, in form of the frustum of a cone, of which the top diameter, length, and bottom diameter are in arithmetical progression, whole common difference is 5 inches, and the solid content of the frustum 6414.085 cubic inches. Now the sloop's company were only 5 in number, and they would have it divided equally among them by sections parallel to the base; required therefore the length and value of each share, valuing the silver at 5 shillings the ounce.

VIII. or PRIZE Q. (84) by *Miss Maria Middleton, Eden.*
(Whoever answers it before Feb. 2, has a chance by lot for 10 Supplements.)

At the front, to the south, of my straw-cover'd cot,
A neat little garden I wish for to plot,
To furnish me fruit, and to foster me bees,
And a circle's the figure my fancy doth please.
At the distance of seventy feet I would enter,
Direct from my door, in a line with the centre.
But just on the ground set apart, ladies, know,
At present two beautiful sycamores grow,
Eighty-five feet asunder, and from my front door
The one ninety-eight feet, the other six score;
And not being willing the same to displace,
The fence of the garden I'd have them to grace.
Ingenious fair ones, now pray be so kind,
As my garden construct, and its area find.

††† The Prize of 10 Supplements for the Solution of the Prize Question has fallen to the Rev. L. Evans; and the other Prize of 10 Supplements also, for the Solution of the Enigmas, Rebuses, Queries, &c. to Mr. Tho. Rimmer; who will please to send some person to call for them at the Publisher's, in London.—Dr. Hutton's Course of Mathematics, for the use of Schools, in 2 vols. octavo, is expected to be published about the end of the year 1798.

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